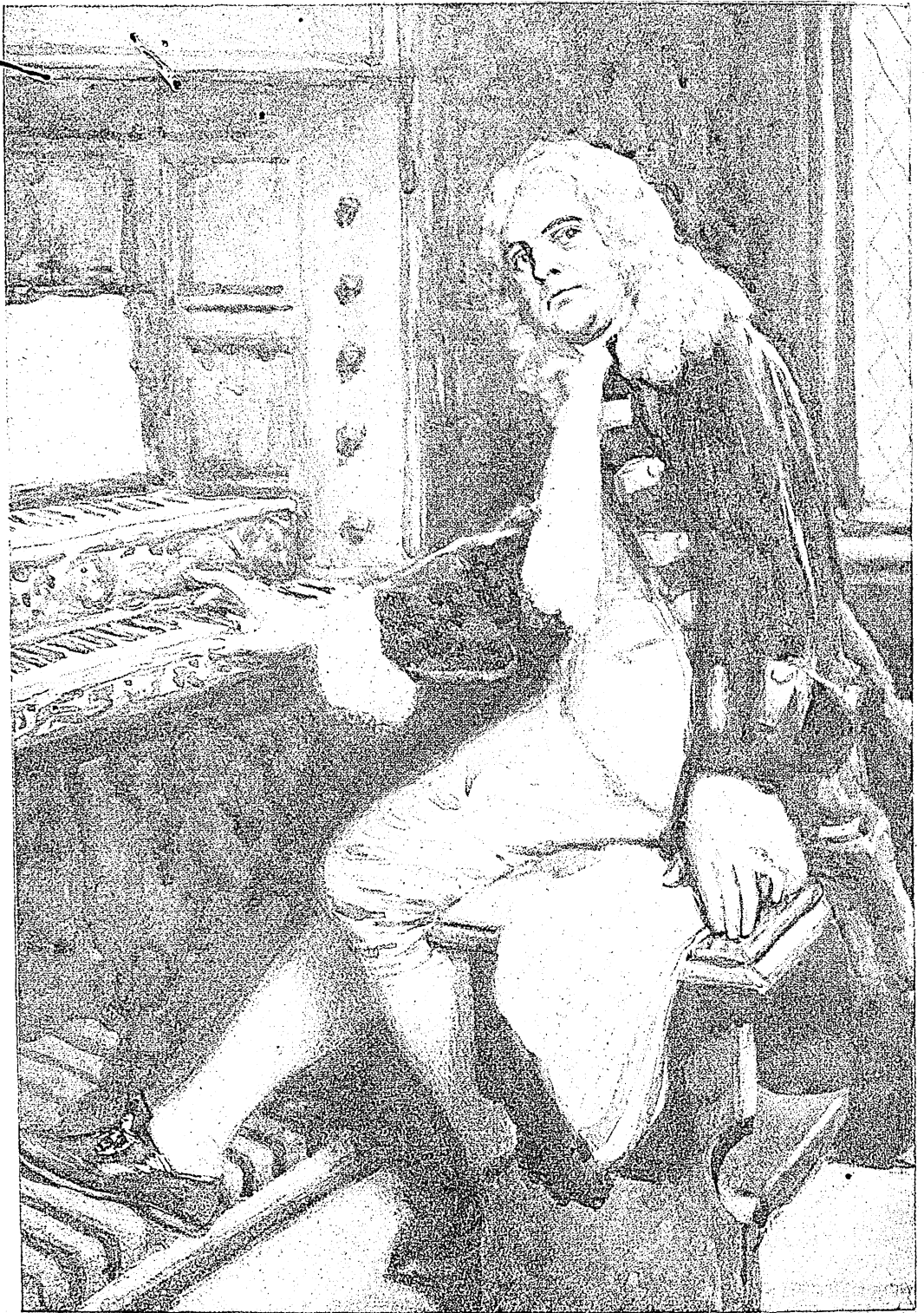


HANDEL, KING OF MUSIC



HANDEL THINKING OUT THE HALLELUJAH CHORUS

030/120

30070

THE BOOK OF KNOWLEDGE

THE CHILDREN'S ENCYCLOPEDIA

EDITED BY

ARTHUR MEE

LONDON

*The following are the Departments
into which the Work is divided*

PLANT LIFE · OURSELVES · COUNTRIES
PICTURE ATLAS · FAMILIAR THINGS
MEN & WOMEN · ANIMAL LIFE
EARTH AND ITS NEIGHBOURS
THINGS TO MAKE AND DO
LITERATURE · THE BIBLE
HISTORY · WONDER
STORIES AND LEGENDS
POWER · POETRY
SCHOOL LESSONS
ART · IDEAS

VOLUME NINE

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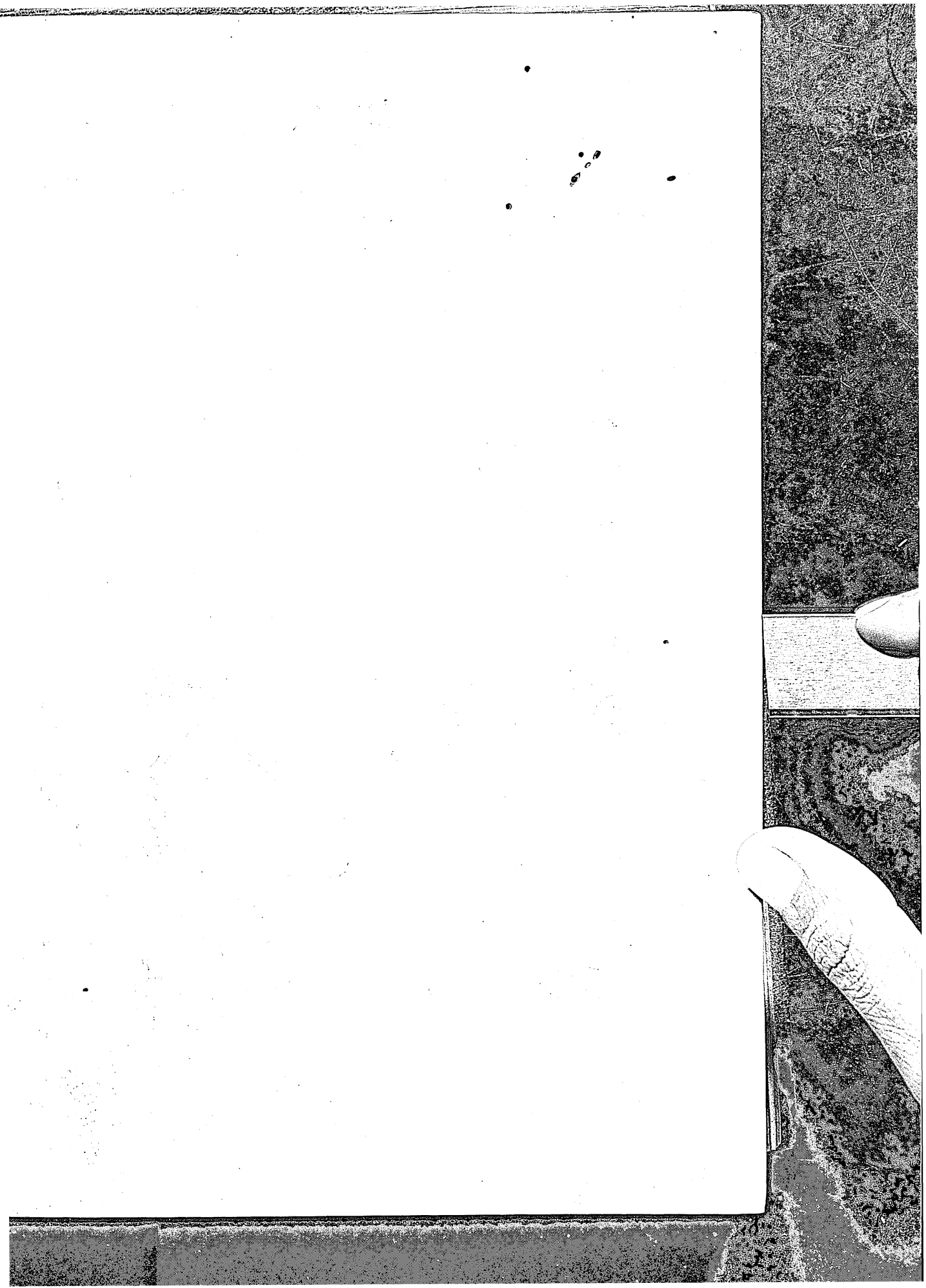
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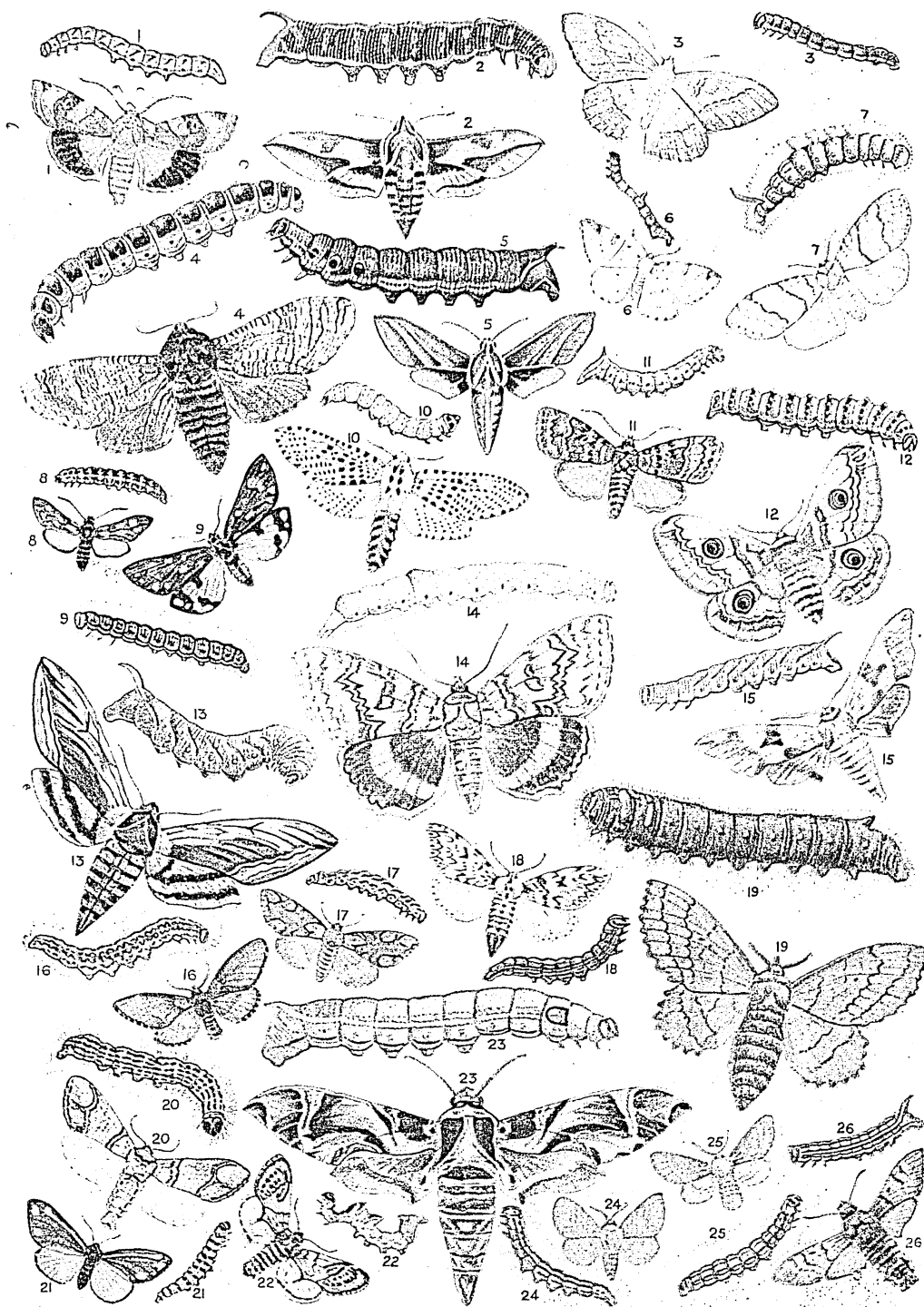
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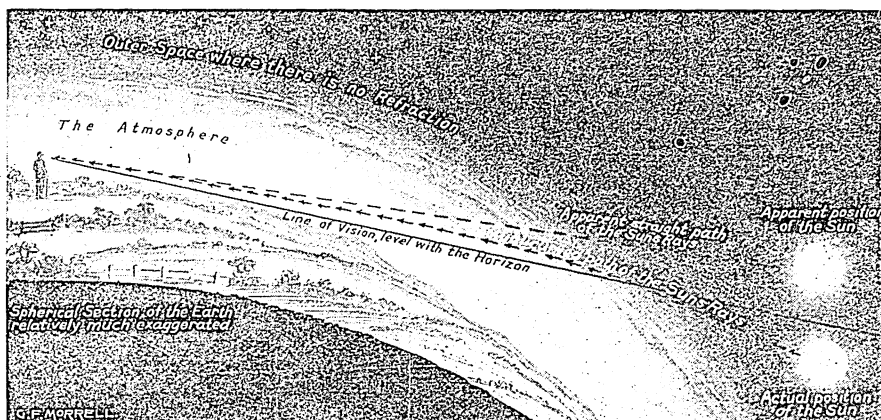
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BRITISH MOTHS AND THEIR CATERPILLARS



1. Broad-bordered Yellow Underwing 2. Spurge Hawk 3. Large Emerald 4. Goat 5. Elephant Hawk 6. Brimstone 7. Pale Tussock 8. Six-spotted Burnet 9. Scarlet Tiger 10. Leopard 11. Copper Underwing 12. Emperor 13. Privet Hawk 14. Clifden Nonpareil 15. Lime Hawk 16. December 17. Peach Blossom 18. Black Arches 19. Lappet 20. Buff-Tip 21. Cinnabar 22. Pebble Prominent 23. Oleander Hawk 24. Lackey 25. Small Eggar 26. Humming-Bird Hawk
See Chapter 51 of Group 4



Why we see the Sun after it has actually set

WHERE COLOUR COMES FROM

WE may now consider one of the most marvellous and mysterious things in Nature, the wonderful colours that we may see in light.

The colour of light is its pitch, and as we follow the colours of the spectrum from red to violet, it is as if we were listening to someone playing an octave on the piano. In the case of sound we know that many notes really consist of more than one note, though it is possible, of course, to have notes made up of waves all occurring at the same rate. A tuning-fork produces such a note, but the violin, or a piano string, or the human voice, produces a note made up of a mixture of different pitches.

It is possible, as in the case of sound, to have light which is made up of waves of one pitch, or light which is made up of any kind of mixture of waves of different pitches. Different colours vary very much in the variety of waves of different pitch that they are made up of, and the eye usually takes these forms into consideration when, as we may say, it likes or dislikes certain colours.

Let us, then, remember that colour is the pitch of light, just as we may say that pitch is the colour of sound.

We know that when we look at the spectrum, though the various colours pass gradually into one another, we see

there a small, definite number of certain colours which we can name and number. We must clearly understand, however, that this appearance is only due to the particular way in which our minds happen to be made. Colour really depends on the number of waves in a second. Within the limits of our seeing, the exact number of waves produced in a second may be anything, and every one of these rates really means, if only our eyes could see it, light of another colour. There are thus actually countless millions of colours, though our eyes can see so few of them.

Just as the number of waves made in a second varies, so also does the size of the waves. The proper name for the size of waves is wave-length, and the rule is that the longer the wave-length the fewer is the number of waves that occur in each second, and the shorter the wave-length the more frequent are the waves. Of the light that we can see, therefore, the dullest, a red that is almost invisible, has the smallest number of waves in a second and the longest wave-length, while the violet is made up of the quickest waves, and has the shortest wave-length.

Of course, we must not confuse the number of waves in a second with the rate at which the light is travelling. A tall man with very long legs and a boy

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with short legs may be running side by side at exactly the same rate, but the boy may be taking three strides to the man's one. In rather the same way all the kinds of light travel at the same rate, but the waves of violet light correspond to the boy's short, quick strides, and the waves of red light to the long, slow strides of the man by his side.

Below the red rays there are, as we know, the rays of invisible heat. These also vary widely, just as the rays of visible light do; and a great student of the subject has made wonderful discoveries about them. These rays cannot be seen; and when rays cannot be seen they can only be studied in some other way. They can be studied, for instance, by means of the heat they produce; and so this man of science invented a marvellously delicate instrument, which is really nothing more or less than a thermometer, but vastly more delicate than the best of ordinary thermometers. By means of this instrument he has been able to study heat waves in detail, and he has shown that they differ from each other, and, indeed, make up a long spectrum just like the spectrum of visible light.

THE KEYBOARD OF INVISIBLE WAVES THAT GIVE US LIGHT AND ELECTRICITY

The one is, of course, a continuation of the other. This spectrum, too, contains lines and places which correspond to the dark lines that can be seen in the spectrum of visible light. Similarly, there are octaves and spectrums of light of which the waves are too short to be seen, and which, because they are of shorter wavelengths than the violet rays, are called the ultra-violet. The waves become shorter and shorter till the X-rays are reached.

This wonderful keyboard of waves extends still farther below the heat rays. The lower waves are slower and bigger. We know them best by their electrical properties, for they are electric waves—the waves that run along the wire of a telegraph or telephone, and the waves, needing no wire, which are used in wireless telegraphy. It is extremely important and useful for us to understand that simply by moving down the keyboard, so to speak, from visible light we come to the waves that make an electric current.

Now, this can only mean that light and electricity are as like each other as the sounds produced by the middle octave of a piano and the sounds produced by the

notes near the bottom of the piano. We rightly use the one word, sound, to describe both of these things, for they are really the same. We might say, then, that electric waves are really light waves which we cannot see, but this is not the best way of putting it. The best way of describing them is to speak of the electric theory of light. This theory simply means that light is a kind of electricity. All these waves that travel at the same enormous speed, are really of one and the same kind, and the only word that describes them is the word electric.

THE LAWS THAT HOLD GOOD FOR LIGHT, AND SOUND AND RADIANT HEAT

As in the case of invisible or radiant heat, some substances admit light, and others soak it up or absorb it, and others will reflect it from their surface. No one can yet explain what are the differences in different kinds of substances which make them behave when they encounter light in these different ways.

Although we do not know why one thing reflects and another does not, we can learn the laws of reflection. These laws really hold good, not only for light, but for radiant heat and for sound; and everyone who has played billiards or bagatelle, or who has thrown an india-rubber ball against a wall, knows something of the laws of reflection.

We know that if we throw a ball straight at a wall, it comes straight back to us; if we throw it sideways, it goes sideways, and it comes off just as much sideways as it was thrown sideways. If a ball on a billiard-table is rolled gently against the cushion at an angle, it will come off again at the same angle. The angle at which the ball approaches the cushion is called *the angle of incidence*, and the law for the billiard-ball, for light, and for all these other cases is that the angle of incidence and the angle of reflection are equal.

HOW THE EYE AND THE MAGIC LANTERN ALTER THE COURSE OF LIGHT

There is another thing which happens to light, as it does also to radiant heat and to sound, and it is called *refraction*. We must always distinguish this word from reflection, which means bending back. Refraction means breaking back. When a ray of light passes from one thing to another, it is always broken, or refracted, and this refraction also has laws. It is extremely important, for we are able to see things only by means of refraction.

The whole of the front part of the eye is really a wonderful piece of machinery for refracting the rays of light that come in so that they shall all be made to fall on the retina, or curtain, at the back of the eye, in such a way as to produce a clear image of the thing we are looking at. Eyeglasses of every kind are used for the same purpose. The use of them all, and of every kind of microscope and telescope, the glasses in front of a magic lantern, and so forth, is due to their power of refracting the rays of light.

Different things have different powers of refracting light. The diamond, for instance, alters the course of the rays of light passing through it much more than water does, this being the reason why the diamond is such a brilliant gem.

But the rays of light themselves differ in their power of being refracted; and refraction is the key to Newton's great experiment. His prism was simply a means for refracting the rays of light passing through it, and the success of his experiment depended on the fact that the different kinds of light are refracted each to a different degree in a regular way. The existence of the spectrum depends entirely on the possibility of refraction.

WHY WE NEVER SEE THE STARS EXACTLY WHERE THEY ARE

If we ask why rays of light are refracted when they pass from one thing to another, a partial explanation can be given. It is that the speed of the light waves is slightly altered when they travel through a different substance, and the different waves are differently affected. The simple rule is that the denser the subject through which the light is passing, the more it is retarded. It may here be added that the facts of refraction are explicable on the assumption that light travels in waves, but have been found difficult to explain otherwise—if, for example, light is supposed to travel in specks or corpuscles.

When the light travelling through empty space reaches our air it is very slightly retarded and bent. A consequence of this refraction produced by the air is that we see no heavenly body where it really is, but at some spot a little distance away; and we can actually see the Sun when it is below the horizon because the rays are refracted as they pass through the air. When passing from air to water light is refracted yet more, and the ex-

planation of the fact is that light waves travel slightly more slowly through water than through air, because water has greater density than air.

We have seen how refraction produces colour by splitting up white light. But there is a way in which reflection also produces colour, and practically all the colour of the world is produced by reflection. It is true that sunlight has its own glorious colour, for, though we call it white light, it is really rather golden; and it is true, also, that luminous things, like flames and fires, have colours of their own, because the light they produce has a high proportion of red or yellow or green or violet rays. But, apart from that, the Earth and the things on it have colours, though they are not themselves luminous; and these colours are produced by reflection from the white light that falls on them.

THE DIFFERENCE BETWEEN LUMINOUS AND NON-LUMINOUS THINGS

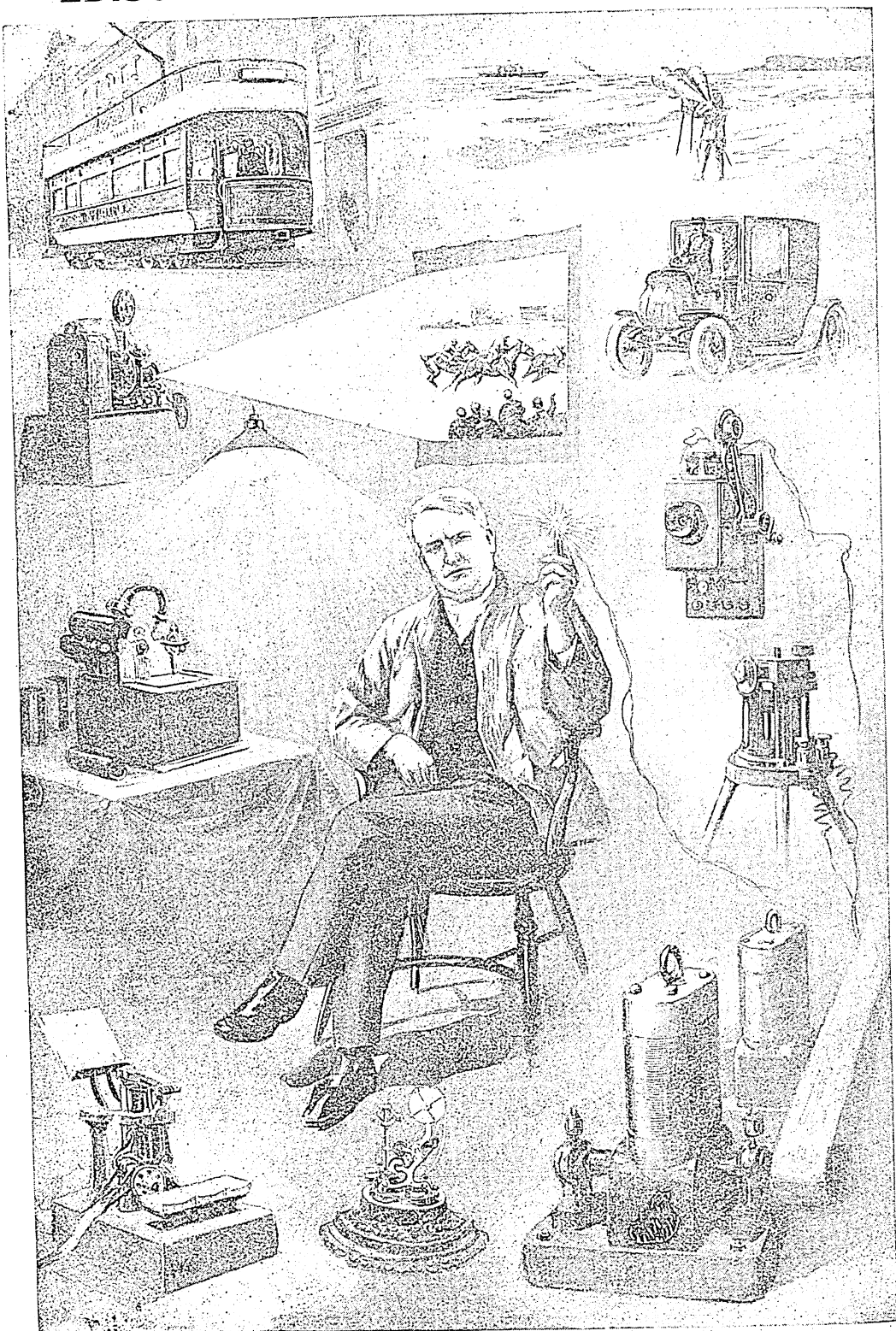
This reflection of theirs is *selective*, as we might say. A white thing does not select, it is white just because it does not select, but reflects all the waves of light which happen to fall on it. Not being luminous it makes and creates nothing, but it will simply reflect whatever light falls upon it. If we throw red light upon it, it will be red; if we throw upon it a mixture of lights called white, it will be white. This is the great difference between the things that are not luminous and the things that are.

The things that are not luminous but do appear to have colour are those whose surfaces, in reflecting light thrown on them, select certain constituents of the light, or certain wave-lengths of it, for their purpose. Thus a substance appearing red under white light is one which has picked out the red wave-lengths of light to reflect.

WHY A PIECE OF BLUE CLOTH LOOKS BLACK IN A RED LIGHT

Again, if a piece of blue serge is put into red or orange or yellow light it appears black. In blue light it looks blue, in violet light it appears violet, in green light it would seem to be green. All this is because its surface cannot reflect red or orange or yellow, but can reflect green or blue or violet. When white light, a mixture of all these colours, falls on it, it absorbs some of the waves and practically destroys their effect, but it reflects on to our eyes others of the waves, blending them so as to produce to our vision a blue effect.

EDISON'S GIFTS TO THE HUMAN RACE

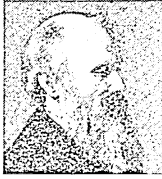


THOMAS ALVA EDISON SURROUNDED BY SOME OF HIS WONDERFUL INVENTIONS

The Story of Immortal Folk Whose Work Will Never Die



Henry Ford



Lord Kelvin



Sir Charles Siemens



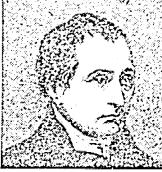
Joseph Jacquard



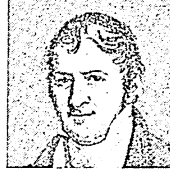
Edmund Cartwright



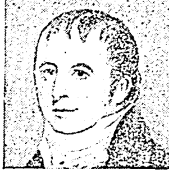
Elias Howe



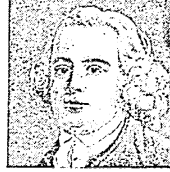
Samuel Crompton



Eli Whitney



Henry Greathead



James Brindley

GREAT INVENTORS

THE world owes little of its happiness to kings, but to its inventors it owes more than it can pay. They have been the founders of our civilisation, the creators of the social world we live in, the preparers of future benefits for mankind.

We have only to look round to see that this is so. We see it in the story of the rise of our great industries. One of the greatest of them, one of the most important industries in the whole world, is our textile industry, and we can trace its rise to a few men who, while they lived and worked, were treated with cruelty and dishonesty and contempt. Sorrow has been the lot of the inventor from the beginning; it is rarely that his reward has come in his own time.

One of the first men behind our textile industry was a Lancashire genius who could neither read nor write—James Hargreaves. Born at Blackburn in 1745, he entered a mill owned by Sir Robert Peel's grandfather, where, as a shrewd and able man, he was set to work to improve a machine for carding cotton in order to abolish the old system of clearing and straightening the fibres by hand.

But he worked at home too. The cotton trade at that time depended largely on work done in cottages and little farms.

Part of the cotton had to be spun into thread to make the warp, and part into the weft (or woof) which crosses the texture. It happened that one day Hargreaves knocked over the simple little machine his wife was using for spinning weft, and to that action we may trace the work he did for himself, for his country, and for the world at large.

The machine was fitted with a wheel and spindle which spun only one thread at a time. When dislodged the wheel and the spindle, thrown from a horizontal into a vertical position, continued to revolve, tangling the thread.

Hargreaves saw that by widening the wheel and employing several upright spindles, he might spin a number of threads at the same time, instead of one as heretofore. He did so in secret, never dreaming that he was to found a new industry, but simply that he might have more material with which to work, and so earn more money to provide food and clothing for his family.

He made his first machine, the original spinning-jenny, and stealthily began to manufacture yarn in such quantities as no weaver had ever thought of producing. The result was that the Hargreaves household was soon making eight times as much

EXPLORERS · INVENTORS · WRITERS · ARTISTS · SCIENTISTS

MEN AND WOMEN

material, and so helping the prosperity of everybody concerned in the mill, for yarn was the one thing they all needed.

But the narrow jealousy of the people of the neighbourhood was aroused at the suggestion, whispered abroad, that Jim Hargreaves was using machinery. Machinery—why, it would rob honest hand-workers of their living; it would drive all folk away from Blackburn and the surrounding towns. The tidings ran like fire, and the weavers of Darwen, Mellor, Tockholes, and Oswaldtwistle assembled at Blackburn, and with the local men, marched, an army of execution, to the poor cottage where Hargreaves lived.

They forced a way into the house, they smashed the machine, they demolished the furniture, and then they marched down to Peel's mill, where Hargreaves was at work, and wrecked that. That is how they taught a man to know better than to invent machines which were to bring millions and millions of pounds to Lancashire, though not for himself.

Hargreaves went to Nottingham and joined hands with a man named Thomas James, who had a little capital and a great faith. Together they began the manufacture of the spinning-jennies, but, having hounded him out of home and occupation, Lancashire was now using his jennies wholesale without paying him a farthing royalty.

THE POOR REWARD OF A MAN WHO MADE FORTUNES FOR OTHERS

The desperate inventor began an action to recover damages, but when his lawyer found how many dishonest cotton manufacturers in Blackburn alone had stolen the device, the threw up his brief in dismay, saying he could not fight an army. Hargreaves did not die in poverty, but when we know that at his death his share of the partnership was sold for £400, we realise that wealth had not come to this man who had placed at the disposal of his native county a device for building up unparalleled prosperity.

Sir Richard Arkwright's story comes into this same time with a greater hardship still, for here was a man with much more to offer, who had to triumph over still more extended injury. Born at Preston, in 1732, the youngest of 13 poor, ill-educated children, he did not master spelling and grammar till he was rich and over fifty. He suffered great poverty

in his youth, working as a penny barber, then as a travelling wigmaker; yet he found time to think out a better machine than that of Hargreaves.

He devised a spinning-frame which provided a stouter material strong enough to be used as warp. But he could not make it, and no one would help him, poor, ragged, and unkempt genius that he was. The instrument maker to whom he applied for help would have nothing to do with him personally, but somehow was persuaded to lend him the services of a man named Kay to make the clockwork part of the apparatus.

THE BUSYBODIES WHO CREPT UP THROUGH THE GOOSEBERRY BUSHES

The trials were made in a little room in Preston, and the whirring of the machine in the guarded hovel at night drew the attention of two old crones who crept up through the gooseberry bushes to the window and listened, then forthwith went about reporting that there was witchcraft in the cottage, that they heard Satan tuning his pipes, and Arkwright dancing to the strains.

As soon as Arkwright reported his invention, the manufacturers cried out against machinery, and drove him to stocking making and calico manufacture. Then they turned against him an old Act of Parliament which decreed that no such fabric should be exported save under heavy tax, nor made at home at all unless it included a linen warp.

Still the gifted starveling struggled on, and patented an astonishing machine, which embraced the entire manufacture of cotton, carding, drawing, roving, spinning, and put the staple trade of Lancashire ahead of all competitors, where it has ever since remained. His reward was to see his patent infringed everywhere by rascally rivals, who denounced his machinery, used it themselves, and refused to pay royalty.

THE TRIUMPH OF ARKWRIGHT IN THE FACE OF FOLLY AND INJUSTICE

Nevertheless he set up his own factory at Chorley, near Preston, and saw it wrecked by mobs. But fanatics among the workers, with robbers and pirates among rival manufacturers, could not defeat his iron resolve. He persevered in spite of all injustice and cruelty, made a fortune, educated himself, was knighted, created our factory system, enormously

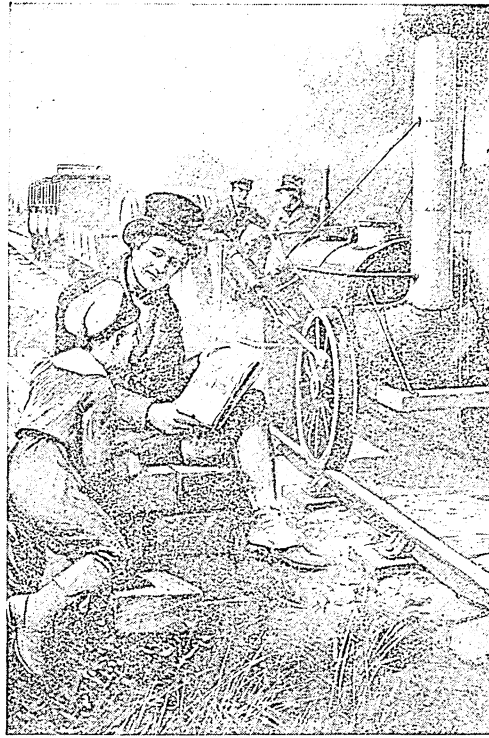
THE GREAT INVENTORS

enriched the country, and died, in 1792, both rich and honoured at last.

Even today it is difficult to write without indignation of these pioneers of our national wealth, and especially when we come to Samuel Crompton, one of the most lovable of them all. Born near Bolton in 1753, he received as good an education as the local day school afforded, but the family was desperately poor. There was musical genius in Samuel, but no money for furnishing him with instruments, so he made himself a fiddle, and learned to play so well that he was able to earn eighteenpence a night by working in a Bolton orchestra.

He accounted himself passing rich on that sum, and bought books and materials for the making of his famous spinning-mule. This was a contrivance of great ingenuity which gave a better yarn than either Arkwright or Hargreaves could produce. He worked at cotton-spinning by day with the rest of the family, he played his fiddle at the theatre in the evening; then, when all the rest had gone to bed, he sat working far into the night, year after year, on his mule.

The machine-smashing frenzy was running through the land, and poor Samuel



YOUNG NASMYTH SKETCHES GEORGE STEPHENSON'S ROCKET



THE WORK OF A WORM INSPIRES BRUNEL WITH THE IDEA OF TUNNELLING UNDER THE THAMES

used to take his machine to pieces and hide it, part by part, in a little secret chamber which he had made in the roof by cutting a hole through a ceiling.

It was perfected at last, and he turned out wonderful yarn with it, secretly made, of course, so that workmen should not rush in and smash his machine. The fame of his yarn soon spread, and from far and near men were sent to spy on him. He saw that he was in danger, that he could not preserve his secret, yet he was too poor to obtain a patent. "I was reduced to the cruel necessity of either destroying my machine," he said, "or of giving it to the public. To destroy it I could not think of; to give up that for which I had laboured so long was almost unbearable."

A Bolton manufacturer persuaded him that if he would make his secret public eighty manufacturers in the town would each give him a guinea. All took the invention; sixty paid. Everybody pounced on it and made fortunes from its use. It extended all over Lancashire and right through the cotton manufacturing districts of Scotland. No one outside Bolton gave a penny to the creator of the splendid labour-saving device.

At last he appealed to the Government, showing that, whereas there were in use 156,000 spindles on the Hargreaves jenny, and 311,000 on the Arkwright machine, there were over four million in use on the Crompton mule. The man who had made huge fortunes for the cotton industry was at last awarded £5000, not by the men who had profited from his invention, but by the Government; and at last, in his poverty-stricken old age, the manufacturers of Bolton subscribed a sum which brought him in a beggarly £63 a year.

THE CLEVER COUNTRY PARSON WHO GAVE US THE POWER LOOM

Then there was Edmund Cartwright, the parson who first applied steam to textile manufacture and gave us the power loom. Born in 1743 at Marnham, Nottinghamshire, he was a man of rare gifts, a classical scholar, a poet, and instinct with inventive faculty. Hearing of the success of Arkwright's spinning machine, the good parson said, "Why not a machine to weave?" And when they answered him that such a thing was impossible, he cudgelled his brains till he had made the "impossible" apparatus.

It was a very rough, great thing, which took the strength of two men to handle, and was not a triumph; so the good parson, who really knew nothing of the practical side of weaving, went forth to see how men actually did weave. Then he returned and built a second machine which could do the work better, faster, and more surely than men. Not only so, but he had the audacity to build a little steam engine to drive his machine, and to his great content at once received an order from a Manchester firm for 400 machines.

The machine-wreckers were still abroad, and the factory for which the machines were furnished was burned to the ground, so the indomitable cleric invented a wool-combing machine which substituted mechanical action for men's labour and gave greatly improved results. Thereupon Parliament was petitioned to stop the use of this machine.

THE MAN WHO LOST A FORTUNE ON THINGS WHICH MADE MEN RICH

From one cause and another the wonderful parson lost £30,000 on these inventions which were to make the nation richer, and in the end Parliament could not but grant him £10,000 reward for his labours and losses. He died in 1823, happy, busy to the last, with inventions

and poetry, a singular blend of romance and practical realism. We forget his poetry today, but remember the far-reaching results which have flowed from those first power looms of his.

The pattern-making loom for lace is known as the Jacquard loom, and has a moving story behind it. Joseph Marie Jacquard was born in 1752 at Lyons, one of a family of lacemakers whose work was so hard, laborious, and ill-paid that he himself would not follow it, as he said, till the toil should be less wretched and the payment better. So he became book-binder, type-founder, hat-maker, anything but a member of the family calling.

When Jacquard was fifty our Society of Arts offered a prize for a lace machine, and Jacquard, musing over the old problem, made a model for his own interest, and put it aside as a toy. But a workman with expert knowledge secretly carried off the model to the Mayor of Lyons. The mayor reported it to Napoleon, who was so delighted with the ingenuity of the scheme that he appointed the astonished inventor to the Conservatoire, there to complete his machine and to take charge of all the weaving.

HOW JACQUARD RESPONDED TO THE CALL OF HIS COUNTRY

Jacquard finished his machine and exhibited it at Lyons, where the mob carried it to the market-place and well and truly smashed it to fragments. Curiously enough the invention passed to England, where machine-smashing was equally rife, and gave us a lace trade which has never died. Then, in self-defence, as it were, the French had to take up the machine, and begged Jacquard to resume control of his wonderful invention.

With that simple humility which marks all fine men, he did so, and was content to see a great trade spring from his machines, and to refuse princely offers to go elsewhere, and give to international rivals the benefit of his skill. He died in 1834, happy in the knowledge that lacemakers would never again toil miserably for wages so inadequate as had been the case with his own family in the craft.

So far we see inventions evolving for the rapid consumption of raw cotton, and the result was that demand for the raw material was outrunning supply. The need brings the man, and this man appeared in the person of Eli Whitney, born at Westborough, Massachusetts, in 1765. In Georgia

THE GREAT INVENTORS

he was brought into contact with cotton growers who were in despair because the cotton had to be cleaned by hand after picking, and the slaves could manage only five to six pounds a day.

Whitney set to work as if the matter was a simple sum, and with amazing facility invented his famous cotton-gin, which enabled anyone to clean 1000 pounds of cotton a day. The invention left him as poor as he had been before, for rascally cotton growers broke into his little workshop, stole his plans, made machines of their own, and gave him nothing.

THE INVENTION WHICH PROLONGED THE CURSE OF SLAVERY IN AMERICA

He therefore set up in business as a maker of firearms, and produced the first of rapid-firing machine-guns; secured heavy Government contracts, introduced the system of sub-division of labour, since carried to perfection by Henry Ford, and died a wealthy man.

His first invention was for the profit of mankind, his second was for the destruction of men, and the first invention did more harm, indirectly, than the second did directly.

For the cotton-gin fixed for another seventy years the shackles which had been about to drop from the slaves in the United States. They had become bad assets, with only five pounds of cotton cleaned a day; but with a thousand pounds of cotton cleaned each day, every bond servant throughout the cotton area was converted into a wealth producing machine for his owner. We have only to look at the English figures to realise what happened.

Before Whitney invented his machine we could get only 138,000 pounds of cotton a year from America. Eight years later America was sending us 20 million pounds of cotton in the twelvemonth. So all thought of emancipating the slaves died suddenly in the Southern States of America, and it was this question that led to the great Civil War.

THE PART PLAYED BY AN INVENTION IN AMERICA'S CIVIL WAR

The Southern States would not give up their slaves, and claimed the right to withdraw from the Union, in order to have freedom to remain slave-holders. The North fought them on that issue. If Eli Whitney had never been born, or if he had delayed his invention ten years, there

might have remained no slaves on American soil, there might have been no American war. But the invention which did bring the war, and purged the United States of its foulest blot, had the effect also of so enormously increasing the world's cotton supplies, that a new cotton-growing country might suddenly have appeared on the map of the world.

Invention never marches solitarily; it creates new needs and invents new ways of meeting them. The growing traffic arising from the trades to which these new gifts gave impetus, called for fresh avenues for transport. With all the facilities of our own age, traffic still keeps ahead of routes; we are hopelessly overcrowded in London and many other great areas of population. Imagine what were the conditions in the eighteenth century and immediately beyond, when good roads barely existed.

The steam railway was not born; Macadam and Telford had not seamed the land with noble highways. Canals seemed a solution for traffic which existed, for traffic which might be created if new coal-fields could be tapped and building sites for factories and mills placed in communication with the rest of the country. The man for the task was James Brindley; the man to summon him to it was the Duke of Bridgewater, who proved a notable patron.

THE APPRENTICE WHO PROVED HIMSELF A BETTER MAN THAN HIS MASTER

Brindley was a very rare genius, born at Thornsett, Derbyshire, in 1716, the son of an incompetent, negligent father, who mismanaged a tiny farm of his own, and let the brains of his children lie fallow. Jim had no more than a smattering of the three R's, never could more than sign his name and roughly scrawl down the figures of a simple sum.

Toil in the fields till he was 17 left the lad longing for a trade in which he could make things, and he apprenticed himself to a millwright, who, first thinking him a worthless dullard whom it was necessary to kick out of the dirty old foundry, lived to learn that the rough, unkempt lad was a better man than himself, who could right machinery which beat the old man, and who with noble honesty could run the business, support himself and the whole family of his master when that master fell ill and palsied of mind.

Jim Brindley could do anything. He could mend a broken machine, invent a new

one, pump a mine by methods crazily original but marvellously effective. Whenever anything went wrong with a mine or a machine, they called on Jim. This boy never failed them. At last the Duke of Bridgewater was seized with his ideas for canals, so he, too, called on Brindley, whose first task under the new control was to link Manchester and Worsley by means of a canal, the first serious venture of the kind in England.

HOW JAMES BRINDLEY CARRIED BARGES AND CANALS THROUGH THE AIR

The work meant that this unschooled genius must tunnel here, raise great embankments there, and carry his canal across the River Irwell by means of a 600 feet aqueduct. Professional critics laughed at the suggestion that barges and the water that bore them should thus be carried through the air; but in July, 1761, barges were actually crossing the river by canal, and passing on their way from the tunnelled water at one end of Manchester to the tunnelled water at Worsley.

Next Brindley linked Manchester and Liverpool, by continuing his canal to the Mersey tideway at Runcorn, the course including two rivers and two deep valleys, the watercourses being crossed by aqueducts, the valleys by broad and lofty embankments. His resources were few and primitive. In the first 600 yards from the Mersey there is a rise of 82 feet, yet Brindley's locks mastered the difficulty.

Altogether Brindley gave England 365 miles of canals. He made the carriage of minerals so simple that it was worth while to open coalfields vital to Lancashire's growing trade, and he called new towns into being or greatly extended old and smaller ones by the facilities he furnished for their trade.

THE GREAT PROBLEMS JAMES BRINDLEY THOUGHT OUT IN BED

He had no ambition beyond canals and commerce. He believed, he said, that Nature meant rivers simply to feed navigable canals. That he was predestined to build the canals of his age he had as little doubt. Yet how slender was his equipment. He trusted entirely to his own strong, steady brain for his plans and conceptions. He drew no detailed plans; indeed he could not. He worked out no elaborate calculations on paper—it was all done in his head. At the end of profound thought he would jot down a few figures as reminders, then work on

again, just as we do short sums in our heads as exercises in mental arithmetic.

If his problem were unusually stubborn he would go to bed and remain there for a day or two at a time. When he got up the sum was done. Quiet contemplation solved all his perplexities, and as the mists vanished from his brain, locks, embankments, tunnels, aqueducts, whole canals emerged, perfect, complete. When Brindley died in 1772 he had given us a system of inland waterways which should have put us ahead of nearly all other countries in the world, and would have done, had not selfish interests been allowed to render his work very largely useless.

Transport tales run naturally from canals to railways and steamships, which have no part in our present chapter, but we must note one of the great might-have-beens of the subject. This was Sir Marc Isambard Brunel. Born near Gisors, Normandy, in 1769, he served six years in the French Navy, where he invented an admirable quadrant. While he was home on leave he met an English girl named Sophia Kingdom, fell in love, and became engaged to her. The French Revolution drove Brunel to America, where he did notable work as chief engineer to New York; but charming Sophia was an irresistible magnet drawing him to England.

THE GREAT REWARD WHICH BROUGHT BRUNEL TO DISASTER

He came here with a new method of cutting blocks for ship's rigging, a scheme which had dawned on him while carving the initials of his beloved Sophia on a tree in the American wilds.

The Admiralty accepted his invention, paid him £17,000 for it, and made a saving of £24,000 a year for a generation by its aid. But it brought Brunel to disaster, for the sawmills which he erected in connection with this and other works were burned down and thus ruined him. He was working at the time on what must have been one of the first ideas for a steamship, and the Government, having encouraged him up to a certain point, revoked his authority, and left him to bear the expenses, so that in the midst of inventions giving us possible sewing machines, boot-making machines, new type-making processes, bridge-building, and what not, he was seized and imprisoned for debt.

One of the finest spirits of the age was flung into prison for £5000 till the Government, shamed into action, paid the sum

THE BOY WHO NEVER FAILED



YOUNG JAMES BRINDLEY MENDS THE BROKEN PLOUGH WHICH HAD BAFFLED HIS MASTER

and released him. He went from the gaol to the building of the first Thames Tunnel, a grand conception, in which he introduced an indispensable new invention, product of a rare piece of observation.

We have a marine worm which tunnels timber and other substances, and, to effect its purpose, builds as it penetrates a limy cell of its own secretion so that the hollowed material cannot collapse on it. Brunel adapted the plan to human art. As he tunnelled the soft earth beneath the river he copied the worm by building up the walls and roof with masonry.

It was an epoch-making plan, for all tunnelling inventions in yielding soil have been modelled on it ever since. In spite of this essential contrivance, the work was overwhelmingly difficult. Again and again the river broke into the workings, drowned men, crushed the machinery, wrecked the undertaking.

Married to his beloved Sophia, Brunel was now blessed with a splendid son, Isambard Kingdom Brunel (1806-1859), who toiled like a giant in the tunnel, sometimes working there day and night for 90 hours at a time. In spite of the efforts of father and son, the scheme was suspended, owing to lack of sufficient funds, for seven years.

THE WONDERFUL TUNNEL THAT ISAMBARD BRUNEL MADE

There the work stood crumbling into waste, waiting for a little money. Finally the public was goaded into action. A subscription was raised and the tunnel was completed, 18 years after its beginning. The work did not in the end serve the purpose for which it was intended, but was used as a railway tunnel. However, it was Brunel's greatest achievement and his monument, a pattern for the world to copy, and its author had the joy of seeing it perfect before he died in 1849.

Steamships came from other brains, but no ocean giants could yet arise, simply because there was no machinery large enough to forge the huge propeller shafts necessary to drive such ships. The hour called for new men and new methods, and James Nasmyth appeared. He was a native of Edinburgh, where he was born in 1808, son of the artist Alexander. James had his father's artistic faculty, but allied to a pronounced gift for mechanics. At 18 he was man enough to make a little steam engine to grind the colours for his

father, but he had that inventive vision which enabled him to design machinery in his mind and then to draw it on paper.

He could see what he wanted, he could imagine its operation, and he was able to sketch down all as if it existed in steel and iron. He served an apprenticeship under one of our grand old early tool-makers, Henry Maudslay, and then risking every farthing he had, £60, he set up for himself at Manchester, to build engines, machines, implements for other men's use.

THE WONDERFUL HAMMER WHICH A MAN INVENTED IN HALF AN HOUR

So, when at last he was asked to provide something which would furnish great forgings for ships, he sat down and in half an hour had a wonderful new project on paper. Prior to this only the old anvil and hammers had been available, and the bigger the forging the less the power of the hammer, for the metal to be worked occupied the place on the anvil where the hammer should have been travelling through the air to gain momentum.

Nasmyth at once designed the hammer which bears his name. It is an invention which raises a great hammer-head high and clear of the object to be beaten, and lets it fall through space from such a distance as to make the blow like a force in nature. It can be regulated with such nicety as to crack an egg or a watch glass, or to beat with titanic force the biggest forging man can make. With that available engineering was armed with entirely new powers, and before Nasmyth died in 1890 the whole character of the industry had been changed by his device.

As complete a change has been effected in the home and in a thousand industries by the invention of the sewing machine, but how different is the story here from Nasmyth's. Its parent was an industrious mechanic named Elias Howe, born at Spencer, Massachusetts, in 1819, and engaged at small wages in a factory for the making of machinery to deal with the cotton which Whitney's gin had rendered so plentiful.

THE PROBLEM THAT WAS SOLVED IN AN INVENTOR'S DREAM

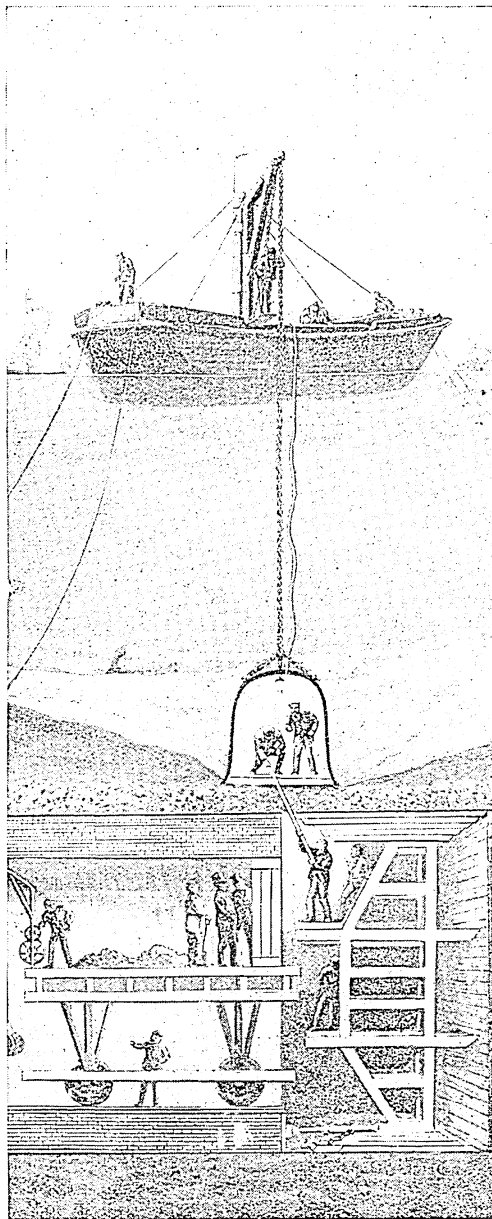
Up to this time all sewing was done by hand, and to Howe it occurred that a machine might ease the housewife's burden. With an ailing wife and a small family, he worked night after night, after quitting the factory, at model after model; always defeated by trying to make the needle of

the machine work as the ordinary needle works, with the eye in the head.

One night, after years of trial, he had a nightmare. He pictured himself as ordered by a savage king to make a sewing machine or die, saw himself a failure, and led out to death by executioners who carried spears through whose blades ran threads of sinew. That gave to his waking thoughts the key to the problem, for every machine needle has its eye at the point, not at the shoulder like ordinary needles.

There was a score of other tricks and contrivances to devise, but all were safely mastered to make the first primitive machine for sewing. It worked. Woman's deliverance from the long bondage had come. But it was the old story repeated. No American would buy or help the invention. Howe sold the English rights for £250, and came over to help the buyer to erect the machine.

When he returned to America he found his young wife dead of consumption and starvation, while pirates were making his machines and gaining fortunes. The same determination which had carried him through the preliminary work supported him in a great legal battle against



BRUNEL IN A DIVING BELL EXAMINES THE BED OF THE THAMES ABOVE HIS TUNNEL



YOUNG EDISON THROWN OUT OF A TRAIN

the robbers. In the end he beat them all, and every machine for sewing had to pay him a licence fee. He died a wealthy man, but to the end there brooded over his success the vision of that young invalid wife who perished for lack of food and medicine while ruffians were coining his brain into illicit wealth.

An almost equal injustice drove Sir Henry Bessemer to great success. Of Huguenot extraction he was a native of Hertfordshire, where he was born in 1813, but found London his immediate Mecca. From his youth up he poured out inventions, the first of which saved the country £100,000 a year. It was a machine for perforating and dating the stamps embossed on legal documents which, up to this time, had been fraudulently used again and again.

He was promised a profitable position under the Government as a reward, but the promise was broken and he had to toil on, providentially at other things, to earn a livelihood.

Bessemer made a fortune from a secret preparation of bronze powder and gold paint, for which printers and painters had paid £5 10s. per pound. He gave them their material at a sixteenth of that cost, in unlimited

quantities. Armed with funds, he began his researches on steel, and, nimbly profiting by accidental discovery, evolved a furnace through which steam or a blast of air was forced to cleanse molten pig iron of impurities and convert it into high grade steel. The plan was given out at first in an imperfect formula, and failed.

In its perfect form the Bessemer process was scoffed at by the trade. Henry Bessemer therefore built mills of his own, and very soon was supplying the world with admirable steel £20 a ton cheaper than any other that could be made. That won the day, and rivals flocked to him from all parts to make his product by licence. He gained a fortune, but his generation profited still more, for it had abundant and excellent metal for bridges, railways, and buildings, such as had never before been even dreamed of.

THE THREE BROTHERS AND WHAT THEY DID FOR THE WORLD

Next came Sir William Siemens, ten years the junior of Bessemer, and a native of Hanover. One of three inventive brothers, he was distinguished, with them, in electroplating, and, not least, in the steel industry. By long and laborious experiment he perfected a furnace in which the open hearth principle was ingeniously exploited for the common good.

Gas was generated from coal consumed in closed chambers, and the gas formed the fuel for the steel process. The idea was novel and admirable, and at length proved an even greater boon than the Bessemer process. Systematically following up the subject, Siemens applied the principle of the recovery of waste heat to the superheating of steam and so enormously improved the whole scheme of steam raising. He died wealthy and honoured in 1883.

HOW EDISON TURNED THE DREAMS OF OTHER MEN INTO REALITIES

More and more Science advanced her frontiers, and the time came when a new generation thought mainly in terms of electricity. Thomas Alva Edison has not given us the promised cheap effective storage battery, but his brain seems to have been a storage battery of the great dreams that have floated through the consciousness of men for thousands of years. With him they became realities.

He was a poor boy, born in 1847 at Milan, Ohio, and with the scantiest education began his career as a hawker of newspapers on an American railway train.

But the papers were his own. He gathered news as the train travelled, set it up from his own type, printed it on a little machine of his own in the luggage van of the train, and sold it to the passengers and to people at stations where the train stopped.

He had also a little electric battery of his own making in that van, but, this setting fire to the compartment, he was kicked out of the train and left at a wayside station, where he was in time to save the stationmaster's daughter from being run over. The grateful father took the boy under his wing and taught him as much as he himself knew of telegraphy. Edison's first venture was to run a wire along fences from the station to the town and to transmit telegrams at a shilling apiece.

Without culture he had the old-time scholar's passion for travel and observation. He would wander like a tramp about the country, working here and there for a little while to earn money which, at the end of six months' hard saving, he would spend on a festival of strenuous experiment and invention.

TAPE MACHINES, TELEPHONES, TALKING MACHINES, AND THE KINEMATOGRAPH

In this way Edison developed a system of sending, by means of currents of varying strength, several messages over one wire at the same time. He made the first of the electric printing telegraphs for Stock Exchange and other news; he created new ideas of his own, he improved on those of other men.

Thus he ranks as one of the pioneers of the telephone. Pottering about with tin-foil on a revolving cylinder, to which were attached a diaphragm and a trumpet, he made the first phonograph, parent of all gramophones and other talking-machines. Next came a still more astonishing invention, the kinetoscope, ancestor of all the kinematograph machines in existence.

He spent thousands of pounds and thousands of hours in evolving what was thought to be a perfect incandescent lamp for electric lighting. His has been superseded by the metal filament lamp, so he missed that other marvel, the thermionic valve for wireless telephony. But he has more inventions to his credit than any other man, and his genius has furnished material for industries which afford a livelihood to hundreds of thousands of people.

From this untaught genius of the poverty-stricken hovel we turn to the

opposite pole, and come upon William Thomson, known later as Lord Kelvin, the brilliant scholar of Glasgow and Cambridge Universities, the most famous professor of natural philosophy of his age, and one of the greatest physicists of all time. He lived from 1824 to 1907.

He was cradled at Belfast, but he, his father, and his brother were all professors in Glasgow at the same time. He had a marvellous career at his Universities, both in classical and scientific subjects. He exhausted the store of knowledge obtainable in Great Britain, and had done a profitable course in Paris under Regnault, before being called to take his own professorial chair at Glasgow.

There he remained for 53 years, lecturing four days a week, twice a morning, to unique gatherings of students. They were unique, not for brilliance, but for boisterous lack of appreciation. He was too profoundly immersed in his great subjects to be understood by any but exceptional students. A few grand young minds comprehended and worked loyally with him; the others jested and went their way. With these few he worked marvels, not in a fine laboratory such as now exists, but in a class-room and in a tumble-down cellar.

But Lord Kelvin was proof against adversity, even in those early days, and was not conscious of hardship, for he was a man of humour, an athlete, a musician, and a blithe companion. The greatest mathematician of his era, Kelvin excelled in minute and complicated measurements, and only by this supreme power was he able to devise the important electrical inventions which immortalise his name.

The first Atlantic cables were useless because far too great a current was sent through them, a current which destroyed

the cables meant to carry them. Kelvin saw that the plan must be weak current and intense power of magnifying the faint signals received.

To this end he invented his mirror-galvanometer, a dainty marvel weighing a few grains. For the advantage of mariners he gave us a new compass and a deep-sea sounding machine for use in any waters by ships travelling at any speeds. These are outstanding revolutions in science known to all the world, but other strokes of his commanding genius are too many and too technical for discussion in these pages.

His inventions were numberless, his contributions to the literature of science almost a library to themselves—the text-books to which learning turns for data and guidance. Yet toward the end of his fruitful life he humbly told an international gathering this: "I know no more of electric and magnetic force, or of the relation between ether, electricity, and ponderable matter, or of chemical affinity, than I knew and tried to teach my class students in my first session as professor."

It is to mix grapes with potatoes to add the name of Henry Ford to a roll which bears that of Kelvin,

yet this American manufacturer is, in his way, as considerable a wonder as Kelvin in his. He was born in 1864, as poor as Edison; he toiled on a little farm, hoeing and cultivating and pondering deeply. "I hoed ten thousand miles," he says, and he hated the monotony and toil.

His own experiences made him yearn to bring into existence machinery which would relieve human beings of this dreary labour. His escape was gained by way of one of the Edison factories, where he became a good mechanic, dreaming of a cheap motor tractor for the farm.



TWO OLD WOMEN CREEP THROUGH THE BUSHES TO LISTEN AT ARKWRIGHT'S WINDOW

MEN AND WOMEN

When he had saved up a little money and determined to start in business for himself, he realised that, farmers being conservative and opposed to new ideas, he must first teach them to be familiar with cars which they could drive before they would regard with favour a motor implement for the land.

THE GREAT IDEA OF WHITNEY WHICH HENRY FORD CARRIED OUT

So began the building of Ford motor-cars, cheap, ugly, but efficient. He had an enormous untapped market in America, and half the world beyond. To supply it he saw that he must standardise his productions, do everything by machinery. He brought to perfection the task of departmentalising industry, which his countryman, Whitney, had long previously begun.

Various partners were taken to help the almost friendless man, but they had different ideas from his. They wanted a new model every year; he aimed at one for all time, so that his machines could go on day and night turning out the same thing, in a continuous stream. He was right, they were wrong. They left, he went on, and became the greatest manufacturer history has known. He turns out cars as we turn out boots, and, like our boots, his cars go everywhere.

In order to secure efficiency from his workpeople, he cut down their hours from twelve to eight per day, and gave them all a pound a day as a minimum. That was in itself an industrial revolution, and benefits in unending succession followed.

THE WONDERFUL ORGANISATION BUILT UP BY HENRY FORD

The work grew to such an extent that he ceased to be merely a manufacturer. He uses, for example, half a million tons of iron a year, and as he could not get regular supplies, owing to strikes, he bought his own iron mines. He bought his own coal mines, he bought a railway for the carriage of supplies and finished cars, he bought forests, he bought rubber plantations for his tyres, cotton plantations for the fabric of the hood; he has bought stretches of riverway which give him immense horse-power in flowing water for driving machinery.

Today he is by far the richest man in the world, and has a plant and stock valued at 500 million pounds. He is a simple, honest, kindly man, a model

employer, a model tradesman, fair to his workpeople, fair to his customers, always striving to raise his men's wages, while at the same time lowering the price of his cars to the public. He is efficiency incarnate, the one man who has solved supremely the problem of making industry one vast machine, and that machine human.

So far all the inventions we have looked at have been for commerce; let us conclude with one designed to profit the heart and not the pocket, the invention of the lifeboat. We are an island people, seagoers from the beginning, yet till a century ago our coasts were sea graveyards to all whose ships went down amid storms. People on shore would watch ships destroyed and men, women, and children drowned during tempests, when not a boat could leave the shore and live.

Pity for poor seafarers stirred a London coachbuilder named Lionel Lukin to make an attempt at a lifeboat in 1785. His idea was good, for the boat had airtight compartments, but the craft was so frail that it could not sail the seas whose violence alone called it into action. And there was a worthy old North Country beadle, in William Wouldhave, who contributed his quota to the fund of invention. But the hero of the achievement was Henry Greathead.

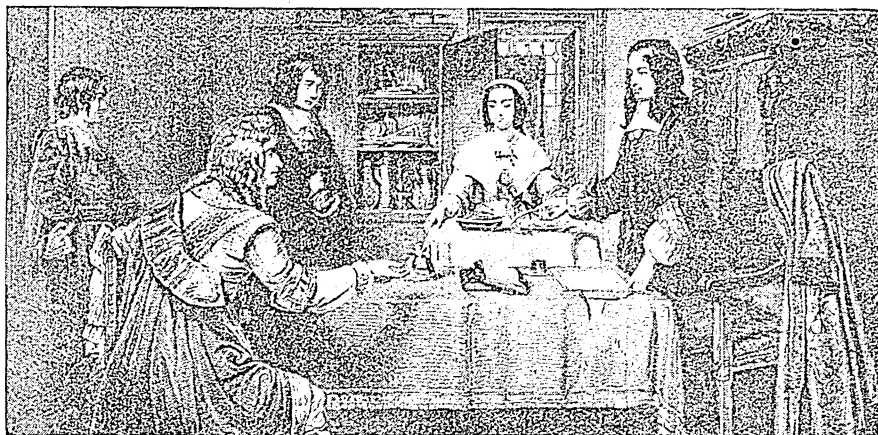
THE DISASTER WHICH INFLUENCED THE INVENTION OF THE LIFEBOAT

He was a native of Richmond, Yorkshire, where he was born in 1757, became a boatbuilder by trade and tested boats and ships in many a tempestuous tide. In 1789 there was a particularly terrible wreck, with total loss of life of crew and passengers, at the mouth of the River Tyne, and so great was the sensation created that South Shields offered a premium for a lifeboat.

Greathead, to his lasting glory, gained the premium, as his own experiences of angry seas qualified him to do. His vessel was but a primitive version of the lifeboats we know now, but it could go out to sea in storms and rescue the perishing. It was the first to do so. It marked the first step in that march of progress which has made the lifeboat one of the finest things in the world.

Greathead was honoured and rewarded in his lifetime; he is the patron saint of every station in the world from which a lifeboat is launched.

The Great Stories of the World That Will Be Told for Ever



THE MAN WHO REFUSED A BRIBE

IN the days when the Commonwealth had come to an end, and a king once more reigned in England, the fortunes of some of the bravest and wisest of the followers of Cromwell were at a low ebb. Milton, who had worked so hard for the Protector, was thrown into prison; and many other people were harshly treated by the Royalists.

There was one faithful follower of Cromwell, however, who had a great influence under the new Government. He was Andrew Marvell, a poet, and Member of Parliament for Hull. Though he seldom spoke, he was a most influential man. He bravely defended Milton.

It was Andrew Marvell's writings, however, that had most effect. They were called satires—that is, writings which bitterly ridicule the words, actions, or writings of another man. For instance, he was very indignant because Charles the Second was always getting money from Parliament and wasting it. The king and his ministers felt that this clever writer must be silenced, and the following story is told of him.

The vulgar monarch Charles the Second was often delighted to meet and entertain Andrew Marvell, taking pleasure in his ready wit and quick repartee. One morn-

ing his Majesty sent the Lord Treasurer, Danby, to seek Marvell, who was a very poor man, and earned but little more than the small salary which the town of Hull paid him as its Member. The crafty king knew this, and told Lord Danby to use every means to win Marvell to his side.

The Lord Treasurer had some difficulty in finding Marvell's lodging, but at last he discovered the house and entered abruptly.

"To what do I owe the honour of this visit?" asked Marvell, looking up from his writing.

"I come with a message from his Majesty, who wishes to know what he can do to serve you," replied Danby.

"It is not in his Majesty's power to serve me," said Marvell.

"But his Majesty wishes you to accept a post of honour at Court."

Andrew Marvell promptly refused to accept the honour, saying:

"I cannot accept any post with honour, for I must be either ungrateful to the king in voting against him, or false to my country in giving in to the measures of the Court. The only favour I beg of his Majesty is that he will esteem me as dutiful a subject as any he has, and realise that it is more in his interest for me to refuse than to accept his honours."

IMAGINATION · CHIVALRY · LEGENDS · GOLDEN DEEDS · FAIRY TALES

STORIES

Danby then produced a bag containing a thousand pounds and placed it on the table, saying:

"The king has ordered me to give you a thousand pounds, which he hopes you will accept until you can think of some further boon to ask of his Majesty."

Andrew Marvell began to laugh.

"Surely, my lord, you do not intend to mock me by these offers? I do not need the king's gold. I have shelter, and as for

my food, you shall hear of that from my landlady. "Pray," said he, turning to her, "what had I for dinner yesterday?"

"A shoulder of mutton."

"And what shall I have today?"

"The remainder hashed."

"And tomorrow, my Lord Danby, I shall have the sweet blade bone broiled."

Danby was quite overcome by the stern simplicity of the poet, and picked up his bag of gold and returned to the king.

HOW ARSHAD SERVED HIS MASTER

HERE is the tale of a valiant man who met his death in a quarrel which was not his own.

There had been fighting for the throne in Persia. The ruler of that land was a boy of thirteen, and in his name ten million people were governed. This boy's father was Shah—the title of the Persian king—from 1907 until 1909, when, because he was so wicked, the people deposed him and made his little son Shah instead.

Mohammed Ali, the father, fled to Russia and plotted for the recovery of his throne, and with him was brave Arshad-ed-Dowleh, his commander-in-chief.

Early in September Arshad led an army into Persia to fight for Mohammed Ali. The general was unwell; his ill-ordered little army was quickly beaten, and he was wounded and taken prisoner.

Arshad was taken into camp late at night. He knew that as he had returned a rebel he could not hope for mercy.

For two hours he and his captors played the game. He was to have no inkling of his fate till morning came, and pride and caution alike prevented him from asking it. So they treated him as one of themselves, and the conversation was carried on in the complimentary language that in Persia even the most intimate friends employ to one another.

There he lay, reclining at his ease, the most eloquent talker of the group, while behind him, in the shadow, a crowd of silent soldiers leaned on their rifles, straining their ears to catch the talk.

Arshad told of the way in which he and the deposed Shah had striven to get together a force to recover the lost throne, and how Arshad himself had gone to Austria to learn military science to equip himself better for his task. And, with death staring him in the face, Arshad was proud of the fact that he had gained a diploma for his skill in military matters.

Twice he mentioned his diploma. He told how he and the Shah had tried to borrow money from Russian officials and had failed, how they had pawned the queen's jewels and bought cannon. Arshad himself took the guns and ammunition across the Russian frontier labelled "mineral waters," and the Russian Customs officers believed the label and did not open the boxes.

It was late when the talk ended, and early in the morning he was seated on a chair in the place where they had talked the night before. He was told, very gently, that he must die, for the State could not afford to let him live.

He looked as if he had slept well and had no fear. They gave him paper, and with a steady hand he wrote a letter to his wife, a royal princess, the daughter of Nasr-ed-Din, a former Shah.

Then he rose and made a speech, declaring that in all he had done he had ever been a man who worshipped his country. While he spoke the steady tramp of the firing-party was heard. It came up level with his left shoulder, marked time, and halted. He ceased, and turned to them. Between the files he went with them forty yards away. He stood erect, unfettered, without fear. When he heard the command "Ready!" he cried, "Long live my country! Fire!"

The volley rang out and he fell, but rose again to his knees with no sign of injury and cried, "Long live Mohammed Ali Shah!" The second section fired, and all was over.

The first section was Mussulman, and some say that each man fired wide, trusting to his neighbour's aim. The second section was Armenian.

However great may have been the faults of Mohammed Ali, he found one man who served him well. Arshad-ed-Dowleh deserved a better master and a nobler cause.

L'HOMME QUI SE RAPPELA

This is a French translation of the story told in English on page 657

SEUL dans une petite pièce de son Palais de Bagdad le grand calife Haroun-al-Raschid reposait sur un divan, les mains immobiles sur ses genoux, les yeux fixés sur le mur vis-à-vis, la tête courbée comme sous le poids d'un fardeau. Il était si impassible, sa pose était si ajustée et si fixe, que l'on aurait pu le croire mort n'était-ce l'éclair extraordinaire de ses yeux.

Le plafond de cette petite chambre, ornée de pierres précieuses, était sculpté à l'imitation d'une fleur ; les murs hexagonaux, en marbre, à part l'entrée et l'endroit où le balcon donnait à travers les cimes des arbres sur les toits de la cité, étaient divisés en panneaux d'ivoire ciselé, si magnifiquement travaillés que, tandis que le calife pouvait voir au travers, personne ne pouvait regarder dans la chambre parfumée, dont le plancher était parsemé de tapis doux et épais.

Une fine tapisserie recouvrait la voûte donnant accès de cette pièce secrète dans le reste du palais.

La lumière était pâle, l'air frais et parfumé, on entendait un doux murmure de fontaine de la cour intérieure. Une branche de plante grimpante, avec toutes ses petites feuilles rayonnantes de lumière, pendait devant la croisée légèrement balancée par la bise.

Le grand calife était assis dans cette pièce, silencieux et immobile, l'âme profondément troublée. Sur son ordre, dans un accès de rage jalouse, le vizir avait été tué, le grand vizir Jaffar, adoré de la cité et tenu en grand honneur dans tout le califat, un homme bon et pur, bienveillant et juste, sincère et miséricordieux.

Haroun l'avait tué. Et, à présent, troublé de l'assassinat, amèrement repentant au souvenir de l'inconscient et abominable crime, il avait peur de son peuple. Car le peuple, contrarié de l'assassinat, avait laissé échapper un cri général d'affliction et de tristesse, une plainte qui était parvenue des rues populeuses de Bagdad jusqu'aux appartements mêmes du calife.

Jaffar était mort—Jaffar, l'ami des pauvres et des faibles, le juge équitable, le gouverneur bienveillant, le bon et saint homme d'abord facile et de vrai courage. Il était mort, ce protecteur des pauvres, ce juge miséricordieux et humain. Qui les aiderait à présent ?

Ce cri de la cité arrivait terrible, aux oreilles d'Haroun. Ce cri l'accusait et le menaçait. Le calife avait le droit de tuer qui il voulait ; personne n'avait jamais osé lui contester ce droit. Tandis que maintenant—maintenant—

Dans sa colère il avait envoyé un ordre à travers l'Arabie entière disant que tout homme qui oserait dorénavant prononcer le nom de Jaffar serait condamné. L'homme était mort ; il fallait que le nom mourût aussi. Haroun exigeait que sa mémoire fût à jamais effacée.

Et maintenant il était là, seul, sachant qu'on le défiait ; car des messagers étaient venus lui rapporter qu'un homme, nommé Mondeer, venait tous les jours crier le nom de Jaffar sur la place centrale, disant au peuple de le pleurer, de chérir sa mémoire, et d'entretenir les enfants de sa bonté, de sa justice, et de sa miséricorde, même au prix de la mort.

Haroun avait tremblé dans son for intérieur à cette nouvelle. Mais son front s'était rembruni, ses yeux avaient étincelé, et, d'une voix de tonnerre, il avait ordonné que ce désobéissant coquin fût amené en sa présence.

Subitement il se leva du divan, grand, magnifique, rempli de grâce, c'était vraiment un bel homme ; puis il enjamba rapidement, en silence, les tapis jusqu'au balcon, se tenant à un instant et contemplant tous les toits de la ville d'un regard troublé. Alors il se détourna et parcourut à nouveau la pièce, avec la même rapidité et dans le même silence, jusqu'à la voûte d'entrée, souleva la tapisserie et descendit l'escalier de marbre jusqu'à la cour où se jouait la fontaine.

Des esclaves se levèrent dans l'ombre de cette vaste et sombre cour, et se prosternèrent au passage du calife tandis que celui-ci poursuivait son chemin.

Il descendit de nouvelles marches, et arriva à la salle de l'audience dont des soldats gardaient l'entrée et où un grand nombre de ministres étaient réunis devant le trône. Il traversa la foule, qui s'effaça à son approche saluant jusqu'à terre, et atteignit enfin le trône, où il demeura debout, tournant le dos à l'assemblée silencieuse pendant un long moment, comme pour se recueillir et méditer sur la décision à prendre.

Alors, se retournant tout à coup et s'asseyant, il fit un signe. Mondeer fut

introduit tandis que des esclaves resseraient ses liens.

"Attachez bien, amis!" cria le prisonnier. "Serrez fort et ne craignez pas de me blesser!" Puis il leva les yeux, regarda le calife, et reprit, "Que les liens qui m'enchaînent soient les bienvenus, qu'ils soient bénis, car j'étais plus impuissant encore et mon sort était plus pénible quand Jaffar me rencontra et me délia pour me rendre la liberté. Ces cordes me rappellent sa belle action, elles réveillent en mon cœur une recrudescence d'affection pour lui, un élan d'amour, une vénération nouvelle, une plus profonde reconnaissance, aussi je les accueille avec joie. Que ton nom soit honoré, O Jaffar, toujours et toujours!"

Tandis qu'il parlait l'âme du grand calife s'enflamma. Faire tuer un tel homme était au-dessous de la dignité d'un grand roi; l'honorer et le protéger serait reconquérir la faveur de l'opinion si éloignée du palais.

Une soif irrésistible de mériter un tel amour et une telle gratitude de son peuple s'empara du cœur d'Haroun. Il envia Jaffar dans sa tombe. Il envia la loyauté du prisonnier heureux de ses chaînes.

"Ami," lui dit-il, penchant son regard sur Mondeer, "tu portes la reconnaissance dans ton cœur, et la reconnaissance excuse tous les excès. Je te pardonne. De plus, puisque tu es sensible aux présents, avec mon pardon, je t'accorde la liberté et je t'offre ce gros diamant unique au monde, c'est la plus belle pierre qui brilla jamais sur la couronne tartare. Prends le et donne moi la place que tu voudras dans ton cœur."

Le prisonnier fut détaché. Il tendit les mains, ses yeux brillèrent avec plus d'éclat que le diamant, et, tournant ce cadeau sans prix vers le ciel, il leva la tête et s'écria avec amour:

"Ceci aussi je te le dois, O Jaffar! Que ton nom soit honoré à jamais!"

A WOMAN AGAINST A KING

THE wife of the Earl of Nithsdale, condemned to death for high treason, came up to London to set her husband free.

But the Governor of the Tower would only allow her to enter on condition that she remained a prisoner. However, she could not then have helped her husband; so she bribed the guards, got admission daily, and quite won their confidence.

After fruitless attempts to obtain a pardon Lady Nithsdale made up her mind, twenty-four hours before the time of execution, that she would help her husband to escape.

The evening before the date fixed for the execution of the earl and other prisoners Lady Nithsdale took two women with her into the Tower, and in turn brought them to her husband's room to take farewell of him. The first, a Mrs. Mills, wore concealed garments, which the second, Mrs. Morgan, put on when quitting the Tower; for Mrs. Morgan took off the outer garments she wore and Lady Nithsdale put them on her husband. Every little detail was thought out beforehand, and the cleverness, skill, and presence of mind shown by this resolute woman were very remarkable. Mrs. Morgan was directed to come in crying and afflicted with grief, so that when Lord Nithsdale, who personated her, went out, he did so wearing a hood and with his face

buried in a handkerchief to cover up his beard. Lady Nithsdale walked close behind him for a little distance to conceal his manly gait, and then returned to his room. The sham Mrs. Mills had been hurried off to fetch Lady Nithsdale's maid.

In the deserted room Lady Nithsdale carried on a pretended conversation with her husband, asking questions and imitating his voice in answer, as well as striding up and down to make the people in the outer room think her husband was still there. Thus she allowed time for him to get clear of the Tower; then she opened the door, and, standing half in the room with her hands on the door, took a pretended farewell for the night, pulled the string through the latch of the door so that it could only open on the inside, and, telling the servant he need not trouble to take in candles, drove off in a coach.

The whole story, related by Lady Nithsdale some time after, shows wonderful self-control, skilful acting, and self-sacrifice, for she was hazarding her own life. The king was furious when he found what she had done, and issued orders for her arrest; but she escaped by her own clever wits, fetched her little boy from Scotland, and joined her husband in France. To this day her descendants treasure the shawl worn by the earl as part of his disguise.

THE FINEST THING IN THE WORLD

WHEN the King of Benares died the captain of his armies seized the crown and drove out of the country the three young sons of the king.

The three brothers crossed the mountains, and came to the edge of a great desert, where the track branched. Seeing an inn by the wayside, the brothers lodged there for the night; but instead of going to bed they sat up till daybreak, planning how to recover their father's kingdom.

"What is the finest thing in the world?" said Prince Deva, the eldest of the three brothers, suddenly, after a short silence.

When the meal was over the three princes paid for their lodging and food, and rode out into the desert.

"I will take the road to China, and come back armed with the power of money," said Prince Deva.

"I will go westward, and see if I can raise an army in Turkestan," said Prince Sanka; "and Amanda can do what he likes in Siam."

"But when shall we meet again?" said the youngest brother.

"Let us meet here," said Sanka, "at this inn, on the first day of spring ten



THE THREE BROTHERS SAT UP TILL DAYBREAK MAKING PLANS

"I do not know," said Prince Amanda, the youngest brother, looking at the innkeeper's pretty daughter, who came in to prepare the morning meal.

"It is power," said Prince Sanka, the second brother. "It was because he had had command of all the power of the kingdom that our father's captain was able to rob us of our rights."

"No!" exclaimed Prince Deva. "The finest thing in the world is money. The wicked usurper of our kingdom acquired his power by bribing all the soldiers to support him."

The two elder brothers continued to argue the matter with great passion, but Prince Amanda was silent and thoughtful.

years hence. Then we will decide which of us three has obtained the finest thing in the world. Even if we only partly succeed we ought to be able to recover our father's kingdom."

The three brothers agreed to all this, and, after saying good-bye, they separated. Prince Deva gaily mounted his horse, and joined a long caravan of Chinese merchants.

Prince Sanka set out on a lonely desert path, running into the wilds of Turkestan.

He was the first to disappear over the sky-line of the wide, bare, yellow desert. Then the caravan in which Prince Deva rode grew smaller and smaller in the distance.

Poor little Prince Amanda stood by the door of the inn, watching it with tears in

STORIES

his eyes until it disappeared. He wanted to say farewell to Saki, the innkeeper's daughter, but she did not come out. Very slowly and sorrowfully he at last rode down the southward track.

The ten years passed away. It was the first day of spring. The little inn at the end of the mountain pass had grown lovelier in the lapse of time. Red roses climbed to the top of the walls, and all the roof was hidden with the beautiful flowers. In the doorway of the inn, framed in the roses, stood Saki. She had grown from a pretty girl into a beautiful woman. She held a little baby girl in her arms, and two red-cheeked little boys clutched her dress and stood on tiptoe, staring at the stretch of tawny sand.

Two great armies were approaching the inn, one from the east and one from the west. Along the track from China there slowly unrolled a broad, unending line of camels and ponies and men in blue robes. At the head of this vast and mighty caravan was a great elephant in golden harness; on its back was a howdah, which is a kind of little house. It was made of jewels, which shone with a dazzling light in the sunshine. In the howdah sat a pale-faced man, wrinkled and careworn, but his eyes were bright and fierce.

The army that came out of Turkestan was terrible and enormous. A hundred thousand lean, fierce, savage horsemen, armed with long iron lances and great curious bows, galloped up on little wiry steeds. They shouted to each other with harsh, strange cries. Their faces were yellow, and beneath their low foreheads their dark, narrow, cruel eyes glittered with fierce joy. Then out from the centre of the host galloped a tall, strong man in bright chain-armor, an iron helmet on his head and a naked sword in his hand.

"Deva!" he shouted to the man riding in from the west on the elephant.

"Sanka!" shouted the other.

They both alighted at the door of the inn, and embraced each other.

"How old and careworn you have grown, Deva!" said his brother.

"I have worked night and day for ten years," said Deva proudly, "but I do not regret it. I am now the richest man in the world. Look at this huge caravan. There isn't a camel or a pony or a porter carrying anything but gold and jewels."

"Yes, you are very rich indeed," said Sanka. "But are you still certain that

wealth is the finest thing in the world? Look at the host I have collected. It took me ten years to get it together, and a hundred or more battles."

"But how can you pay a hundred thousand men?" asked Deva. "I tell you again, wealth is the finest thing in the world. I have only to offer your soldiers more money than you give them, and they would desert you and follow me."

"You are wrong!" said Sanka, in a furious voice. "Look at this trumpet. I have only to put it to my lips and give the order, and my men would slay all your porters, and this wonderful wealth of yours would be mine in less than five minutes."

Prince Deva's face was white. He looked at his brother in a strange way, and his eyes were narrow and cunning.

"I must admit you have the best of the argument, Sanka," he said at last; but his eyes grew more cunning in expression as he said it. "But where is little Amanda? I wonder what he thinks is the finest thing in the world."

"I am afraid the poor, simple little creature will be no use to us," said Sanka. "I have power and you have wealth. What else is there worth struggling for?"

A tall, handsome young man, with bright, gay eyes, came out of the inn. He was clad in a workaday dress. In the doorway of the inn Saki and the little girl and two boys stood watching him.

"It is poor Amanda," said Deva.

"Well," he added, as his brother ran up and embraced Sanka and turned to him, "you do not look as though you have found the finest thing in the world."

"But I have," said Amanda, with a happy smile. "Instead of going to Siam I turned back, and I have never since left this inn. There is my wife at the door, and our three little children."

"Just like a silly boy," said Prince Deva, "to think that love is everything in life."

"It was not love that made me turn back to this little inn," said Amanda very softly. "Love came afterwards, with other blessings. I found here something without which love and wealth and power and everything are but dust and ashes."

"What was that?" said the two elder brothers. "Tell us, what was it?"

"The finest thing in the world—contentment!" said Amanda.

The two elder brothers were silent. They looked at each other, they gazed at

THE FINEST THING IN THE WORLD

their armies, and then they walked slowly up to the inn where Amanda's wife and children stood. Suddenly Prince Deva fiercely gripped Prince Sanka's arm.

"The boy is right!" he cried—"the boy is right! Do you know, Sanka, I was not even content with all my wealth, and I was scheming to bribe your army to betray you and get your power."

"And I had resolved to rob you tonight of all your wealth," said Sanka.

"I don't see why you wanted to scheme against each other," said Amanda.

"I must get an army to win back our father's kingdom," said Prince Deva.

"And I must get money to pay my soldiers, as I mean to lead them against the usurper," said Sanka.

"The usurper?" said Amanda. "He died nine years ago. Since then hundreds of messengers have come from Benares asking me to return and be king. But I am too contented to think of going."

Oh, how Deva and Sanka laughed! All their labours had been unnecessary.

In the end they had to give a great part of Deva's wealth to Sanka's army of fierce savages in order to induce the tribes to go back to Turkestan. The eldest brother would not accept the crown. He became a happy and contented inmate of Amanda's house; and though Sanka went back to India and became king, and had a long and happy reign, he often admitted that it was Amanda who had found the finest thing in the world.

THE GOOD SAMARITANS OF THE DESERT

THEY have no Victoria Cross in the United States or they would have awarded it to Louis Westcott Beck, and a special one to his big dog Rufus.

And yet, perhaps, they would not give medals at all. We do not give medals to the monks of St. Bernard or to their dogs; and Beck and Rufus have done in the blazing desert the work that the monks and their dogs do in the snowy Alps. It came about in a strange way.

Louis Beck was a miner seeking a lode of gold or silver which would make him rich. He had many adventures in search of wealth, but never reached the object of his dreams. In the course of his wanderings he found himself in Nevada, the most barren and desolate area on the American continent. For hundreds of miles stretches the almost sterile desert, with practically no vegetation and with only a few springs, miles apart.

Louis Beck, with some friends, wandered miserably on and on, in search of the gold and silver that were not there, down into the worst part of all the desert, a part which, from its horrible character, men have named Death Valley. They found nothing to reward them. Their food stores were dwindling; their water supply was exhausted before they could find fresh. They had a terrible march of two days and nights without a drop to drink. Their tongues were parched and swollen, so that they could not speak, and they were almost at the last gasp when they found a tiny stream trickling out of a cleft at the foot of the Panamint Mountains. They drank and lived.

Beck returned to civilisation a changed man, with a fixed purpose. Not for nothing had he seen those horrible desert sands strewn with dead men's bones. He remained among his friends during the winter, and in the spring he called up his big Newfoundland dog, Rufus, and set out again for Death Valley.

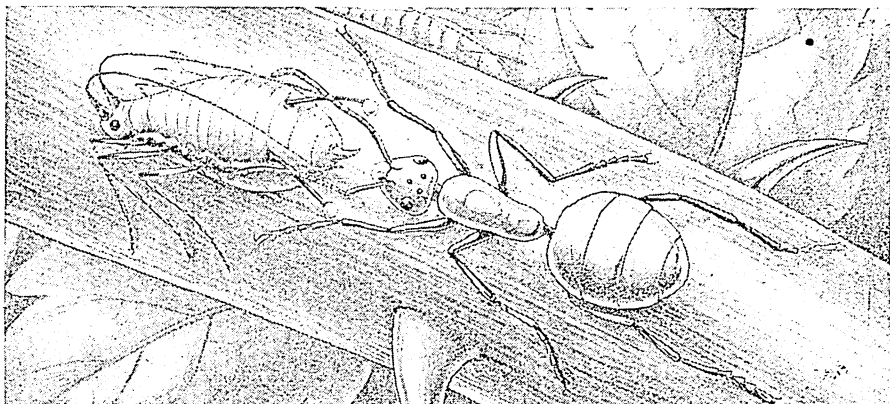
This time Beck took with him a load of thin metal strips, on which he could write directions. These strips he set up as signboards to guide dying miners to water and shelter.

Beck and Rufus continued their work until Death Valley is no longer a valley of death. With Rufus to help in carrying his luggage, Beck stalked through the valley finding new streams and marking them, piling up rocks and setting upon them his little metal strips, to tell the weary wayfarers where they may find the life-giving stream for which they are seeking. While still keeping an eye open for the gold-mine he yet hoped to find, Beck made himself more precious than gold to travellers in this dreaded valley.

Together he and Rufus continued to patrol the purple waste, Rufus, with his marvellous instinct, leading his master to where exhausted miners had fallen. Sometimes they were too late, and only the dead body of some poor sufferer remained to tell the tale.

There is no medal for Beck, no medal for Rufus. The dog has earned a set of leather gaiters to protect his legs from snake-bite, and Beck has merely earned the gratitude of all mankind.

Nature's Wonderful Living Family in Earth and Air and Sea



An ant milking an aphid

THE WONDERFUL ANT

WITH a certificate from Solomon for diligence and wisdom, the ants are perhaps the most impressive little creatures in the entire animal kingdom. Their social system is higher even than that of the beehive, and in many ways startlingly resembles that of mankind.

Aspects of ant life present themselves which outdistance the skill and instinctive habits of tribes of men known to science. These insects have a knowledge of hygiene, of the art of taming other creatures and employing them for service, which is a state immeasurably ahead of that of untaught savages.

The savage has no civic life, no home, no animals, no crops. The ant is a citizen of a considerable city marvellously planned, with ordered streets and highways, with nurseries for its young ones, with storehouses for its food, with quarters for its army and workers, with cattle abounding in stables which are in reality strong places of durance.

So proficient are ants in the technique of communal life that with a little care and patience an informed author might write a story of their routine in peace and war which might pass for a description of life in a human community.

They have many virtues comparable with human attributes, but they have

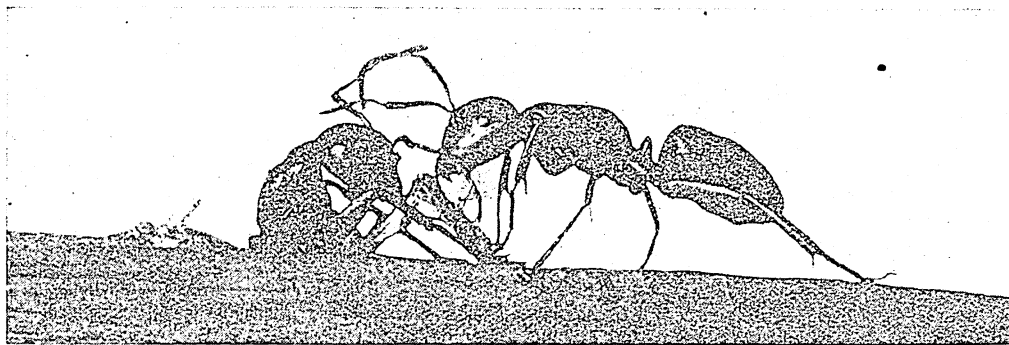
vices as pronounced as ours, and of the same kind. The attitude of the ant towards nearly all animal life but their own and that of the creatures which they take as slaves and supplies into their nests, is one of intense hostility—if hostility is the correct term. Perhaps we had better say that they have an appetite for anything that lives, and that in gratification of that appetite they are merciless, and eat while the victim is alive and in agony from their thousand envenomed bites.

Courage is the badge of all the race. That they swarm to the attack of huge pythons which crush cattle is at first incredible; but then the snake can have no terrors for enemies whose numbers are overwhelming even after thousands may have been crushed by the writhing giant. The ants win in the end, and devour the great reptile. A snake is so huge and incomprehensibly formidable that they may slaughter it in ignorance of the wonder they perform.

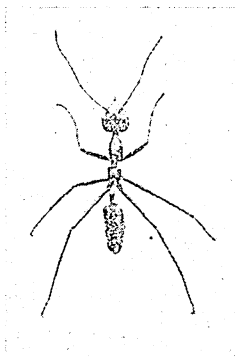
A timid man in ambush may slay an elephant or a tiger, yet flee from the uplifted fist of a puny member of his own race and sex. How, then, does the ant fare against an antagonist whose powers it may reasonably be expected to appreciate? There is no better answer than personal experience furnishes.

PREHISTORIC LIFE · MAMMALS · BIRDS · REPTILES · FISHES · INSECTS

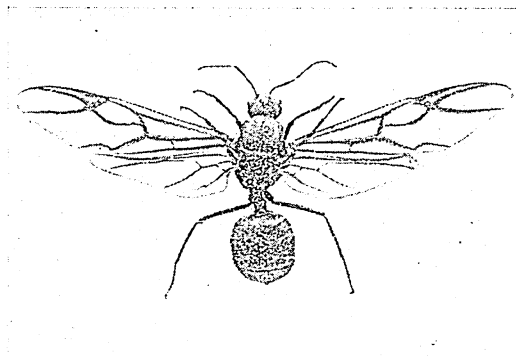
A FEW OF NATURE'S LITTLE WORKERS



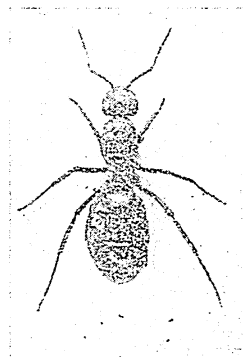
CARPENTER ANTS AT WORK



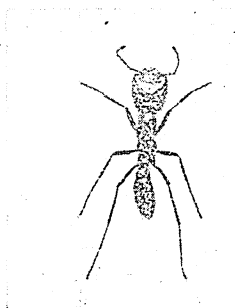
TAILOR OR SPINNING
ANT WORKER



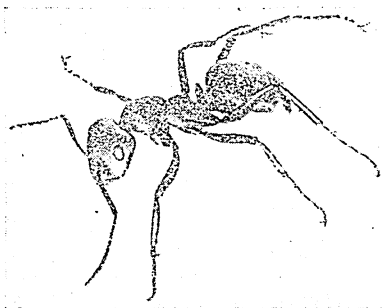
A WINGED FEMALE
SPINNING ANT



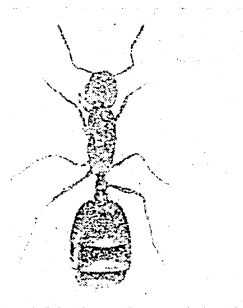
QUEEN WOOD
ANT



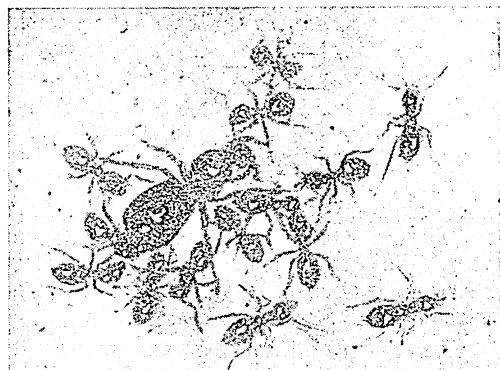
DRIVER ANT WORKER



RED WOOD ANT WORKER



HOUSE ANT QUEEN



ANTS REMOVING THE BODY OF A DEAD QUEEN



A SWARM OF BUSY ANTS

ANIMAL LIFE

Practically all the citizens are her children, yet not quite all. The so-called sexless workers have the power, in time of need, to lay eggs, but, so far as has been discovered, these eggs always turn into male ants, the drones. When food supplies flag, the queen ant, like the queen bee in similar circumstances, is apt to produce a preponderance of male eggs, but otherwise she determines their advent, first laying the worker eggs, then the queen eggs, and finally the drone eggs.

This order is necessary, for the more the workers the greater is the supply of food brought in, and the larger the staff of little workpeople to carry on the labours of the ant community.

Let us imagine the summer hatching season in progress. The egg becomes a grub, legless, wingless, helpless. It is affectionately fed by the workers, who pre-digest the food for it in the same way as the bees do for bee larvae.

Not only are the grubs fed and cleansed ; they are carried about the city daily for airing and exercise. The period occupied by the grub stage is variable, but probably in no case more than two or three weeks.

THE SILKEN JACKET THE ANT GRUB MAKES FOR ITSELF

At the end of that time the ant grub accomplishes a sort of natural miracle ; it spins itself a vestment of silk, a cocoon in which it lies foodless and inert, while undergoing the change from a writhing maggot into a perfect ant. Three weeks is about the average term for this transformation. Throughout that time the workers tend the sleeping creature with all the oving assiduity which they displayed to the ravenous grub.

Daily it is visited by its careful attendants ; it is even carried up to an outlet of the city and screened by some sheltering stone where it may derive the advantage of sunlight without the danger of observation. It is strange that these little people of the dark underworld realise more than we do the importance of sunlight to waxing life.

At last the slow wonder is achieved, and a little ant is ready to issue from the silken shirt which the grub wove. But it cannot do so unassisted. The workers have to aid in the removal of the imprisoning robe. It is a full-sized ant that creeps from the cradle bondage, for all development as to size takes place in the hungry grub period. But the new ant is not yet

fit to exchange buffets with its enemies in the outside world.

It must still be fed and nurtured by its elders ; it must be taught its duties in the nest, like a new boy learning the regulations at school. For a fortnight or three weeks this probation may last, in which time the new ant is housemaid, scavenger, builder, nurse, all things by turn. Finally it joins the hunters and goes out into the world to battle and capture food.

THE FEEBLE DRONES WHICH LEAVE THE NEST NEVER TO RETURN

With the drones and queens the process is different. The queens enjoy a regal exemption from all toil but egg-laying. The drones do a little work, but are rather feeble folk, and cannot entirely feed themselves. On swarming day out they go to meet queens from other colonies. They never return. They are destroyed by birds, by other insects ; winds and rains sweep them in multitudes to destruction, or they fall wearied at night to perish.

The queens, however, return to earth, and either enter an old city, to live in amity with the reigning queen, or start a colony of their own. Whichever the course, they have that one flight and that alone, for the first thing they do, on regaining the nest, is to bite off their wings. Should a returning queen be remiss in this respect, the workers bite her wings off for her ; there is no second sallying forth for a queen, unless it be on foot, to change her nest with all her children about her.

Such an occasion is deeply interesting to watch, for we are able then to realise what a value the ants set on child life. Next to the queen herself, if indeed second at all, they rank the eggs and babies foremost in significance. No nomadic tribe of men and women marching across a continent ever showed more devotion to their children than these puny insects show for their eggs and infants. They are carried with a jealous affection which it is ill to challenge.

THE GREAT ARMY OF FOLLOWERS IN THE TRACK OF THE MIGRATING ANTS

Such a migration is marked by an unexpected revelation. The colony has a host of camp followers, various insects which are the living treasures of the owners of the city. There are many beetles, there are lesser breeds of ants, there are multitudes of green-fly.

These camp followers go where the ants go, some not voluntarily. The willing ones are either parasites or pets. Over

THE WONDERFUL ANT

500 species of insects are known to inhabit ant nests. Some of them are kept because they diffuse odours pleasant to the senses of the ants. Some yield sugary secretions, some are unmistakably pets, things the ants rejoice to keep, feed, and guard, just as boys love to keep rabbits, birds, and caterpillars.

But the greatest wonder investigated up to now is in relation to the aphides. What do green-fly, creatures of the foliage and the open air, down in the gloomy recesses of an ant city? They are the cattle of the ants, the milch cows. As we all know to our cost, the green-fly emits a sticky solution, which we call honey-dew. This is so plentiful when the green-fly are well fed that not only does it impart a glutinous sheen to the leaves of our trees, but actually drips to the ground.

That honey-dew is the dearest food treasure of the ants, and to get it they practise arts which we could not believe, had observation not been a hundred times confirmed. The ants take the aphides prisoners, carry them down into their cities, and build them into pens which have approaches large enough to permit the passage of an ant's body, but too small to permit a green-fly to get out once it has been secured.

HOW THE ANT CITY MAKES SURE OF ITS CATTLE SUPPLY

The aphid has to be kept alive, far from its natural food supplies. The food is brought to it by the worker-ants, and the green-fly becomes as dependent on its captors as the caged birds in the Zoo on their human keepers.

The green-fly makes its return in the form of honey-dew, which it surrenders to the ant at a touch of the latter's antennae. We may see this done in the open, where an ant approaches a green-fly on a rose-leaf and there gently milks it, as it were.

But the green-fly, though prolific, are short-lived; how is the supply to be maintained? In the autumn these amazing insects collect the eggs of aphides laid on plants in the open, carry them down into their subterranean nurseries, keep them there all the winter, and when they hatch out in the following spring, transfer the baby green-fly to the air and restore them to the food plant on which they will grow to strength and sufficiency of honey-dew.

If we consider that fact for a moment we see that it eclipses anything else in the way of prudent provision accom-

plished in the whole animal world, beneath the status of Man himself. That is not merely thinking of tomorrow, it is careful budgeting in terms of food and life for next year's needs.

That happens in abundant instances in England, so we are prepared to find ants in warmer lands extending the same type of prevision to the products of the field. The agricultural ants of southern Europe, and of various places in the New World and elsewhere, garner grain for future use with superb skill.

THE LITTLE UNDERGROUND BARN WHERE FOOD IS STORED FOR THE WINTER

They have been credited with too much talent. They have been said to set the seed and reap the harvest. What they actually do is to bite down, in the vicinity of their cities, all vegetable growth save the grasses, called ant rice, which form a large part of their food. This gives unchecked opportunity to the ants' cereal. When it ripens, they carry the seed down into their barns and store it against the coming of winter.

Buried grain germinates with heat and moisture, but not where an agricultural ant buries it. With supreme wisdom the little husbandmen bite off the radicle, the life-germ of the grain, so that it cannot grow. But it is found that when they desire sugar they allow a certain proportion of their booty to begin growing, and eat the transformed product, while still maintaining an ample reserve of the dry sterilised grain.

A new vista of perplexity opens here, the relations of ants to the plant world. Eager as they are for flesh food; the majority of ants dote on honey in all its forms, and this craving makes them robbers in harvest scenes where they contribute no valuable return. Smooth-bodied and hairless, they are not pollen carriers as are the bees, so plants arm against them. The subject belongs more to botany than to the animal world, but the student of the ant must devote attention to it in the proper quarter.

THE FIERCE ARMIES THAT PROTECT AN ACACIA TREE OF AMERICA

We must, however, include here one amazing instance of mutual accommodation between trees and ants. The tree is a certain South American acacia, notably thorny and forbidding of aspect, yet generous of leaf, irresistibly alluring to hungering herb-eaters.

ANIMAL LIFE

Now each of those threatening thorns on the acacia is simply the outward defence of what is a fortress within, garrisoned by ants! The thorns are hollow, and inhabited exclusively by a specially virulent species of ants, which, when the tree is menaced by man or animal, dash out, swarm on him or it, and bite and inject poison as if they loved their task and their tree.

How does the tree lure the ants to itself? The homes it affords are well enough, but if the ants had to roam in search of food the defence would be intermittent, and disaster might befall while the guardians sought their daily bread abroad. So the food is grown at home.

Each leaf of the acacia exudes honey in a generous stream, so that the garrison is furnished with meat, drink, and abode all on the same tree, and on the same terms as those on which the old man-made cities of Europe, and the feudal castles and estates of medieval England had their constant armed defences. Flowers spread their charms for the delight of bees, but this extraordinary tree is modified entirely for the reception, housing, victualing, of nothing but ants, and entertains its armed retainers in myriads.

THE RETURN OF THE RAIDERS UNDER THEIR PARASOLS

One of the functions of these acacia-haunting ants seems to be to keep off marauding ants of another species, the famous sauba or parasol ants, as they are called. Their second name is derived from their habit of cutting out sections of leaves and carrying them upright, like umbrellas, over their heads back to their own nests. In the wilds their practice is harmless, for though they strip a tree, recovery is easy in that generous climate. The danger arises when men advance into the ants' territory and there seek to grow coffee, oranges, and other products of civilised life.

Here these leaf-cutters are a destructive terror to the grower. They cannot press into service ants like those possessed by the acacia tree, so they denounce the parasol ants with vehemence and leave detached naturalists to admire and marvel. There is reason to do both. The saubas have an invincible organisation. Included in their ranks are not merely ordinary militant workers, but huge-headed soldier ants, with terrific biting jaws.

When a leaf-cutting foray is coming, the soldiers marshal the workers into

ranks, and themselves take guard on the flanks, where they attack and devour any enemy they may meet. In the same order the procession moves home with the booty. Enormous nests are made and stored with the leaves brought in—cities nearly 40 feet in diameter and ramifying below ground in ordered mazes of intricate town-planning.

THE DIVISION OF LABOUR AS PRACTISED BY THE SAUBA ANTS

Here are stored the stolen leaves, where after treatment by the ants, the vegetation throws up a mass of fungus, which forms the food of the ants. Some naturalists believe that the ants cultivate the fungus. We do not know. It is certain that the fungus grows after the ants have gnawed it; we have no proof that it grows without such treatment.

There is a scientific division of labour among the saubas, in the open as in the depths of the city. Multitudes scale the trees and drop the severed leaves to the ground where waiting workers pick them up. But classification of tasks seems general throughout the hundreds upon hundreds of species of ants whose ways have been studied. Some of them have a perfect method of co-ordinating effort for the common good.

We see them transporting grains of corn, three or four ants to a grain, carrying prodigious burdens in proportion to the size of the bearers, half a mile and more. Others carry worms in the same way.

It takes three ants to support and move the particular worm they favour. To do the work, the three line up one behind another. Each straddles the worm and grips it with its jaws. Then they march, and, under a good magnifying glass, the bearers and their burden seem the living counterpart of those great vehicles which we employ for the carriage of tree trunks.

THE LIVING STOREHOUSE IN WHICH THE ANT KEEPS ITS FOOD

Nature has played her part in enlarging the ability of the ants to departmentalise life. Nothing stranger in the world is to be found in this direction than the honey-pot ants. This is a Mexican species in which certain of the workers remain ever in the city to act as animate honey-combs. The workers bring in their nectar and calmly pump it down the throats of the honey-pot receivers. The sweet fluid passes down the gullet of the receiver and into the strangest of all stomachs, a tough

AT HOME WITH THE ANTS



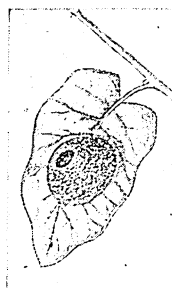
ANT HILL
SECTION



NEST OF AN
AUSTRALIAN ANT



SAUBA, OR PARASOL, ANTS CARRYING
LEAVES TO THEIR LARDER



NEST OF A
MALACCAN ANT



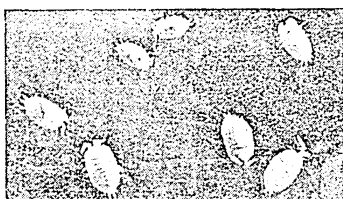
TAILOR ANT'S
NEST



INSIDE THE WOOD ANT'S NEST



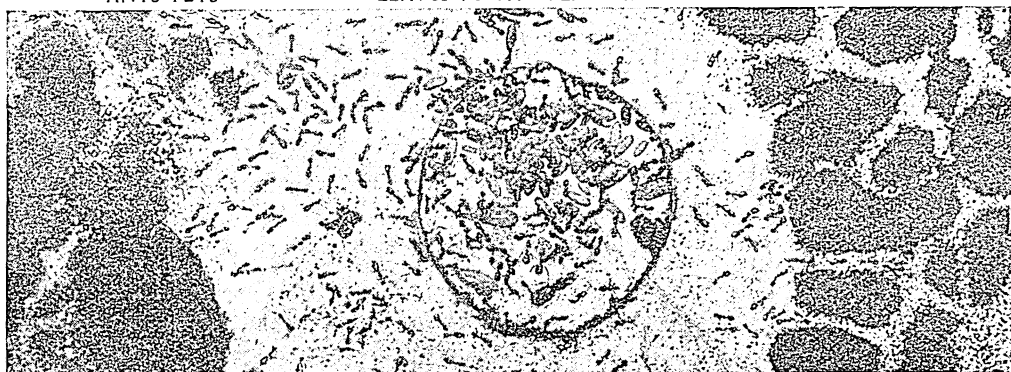
NEST OF THE WOOD ANT



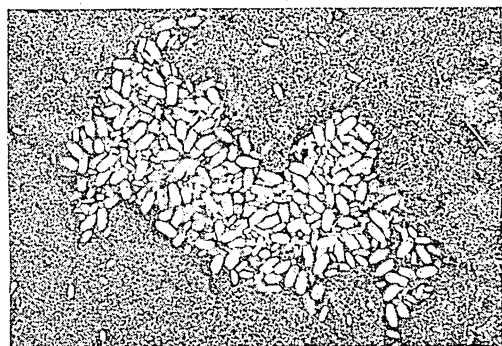
A STABLE OF
ANTS' PETS



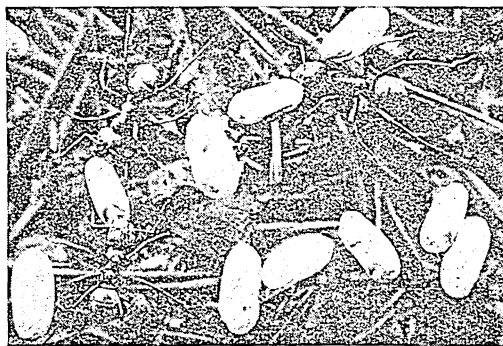
MEXICAN HONEY-POT
ANTS AT HOME



MEADOW ANTS AT HOME IN THEIR NEST



PUPAE OF THE BLACK ANT



ANTS CARRYING COCOONS

The pictures on these pages are by Messrs. Collins, Paul Griswold Howes, and others

little balloon, as it seems, in which all the natural digestive organs are present, but ridiculously reduced, simply to permit of an enormous extension of the crop for the storage of the honey.

The ancients imagined a Tantalus, whose fate it was ever to have luscious food and pleasant drink brought almost to his lips but never quite within reach. The ant Tantalus is filled to bursting with the spoil of innumerable flowers, but is not permitted to enjoy more than the barest amount of sweetness; it must receive at command and give back at a summons. The ants give, the ants take away, when they need honey.

That is the most curious adaptation we shall find; but there are others in the line we have considered, of blended forms and endeavour in the ant tribes such as Solomon never knew. Some species have engineers which, when the workers move out, construct tunnels for them so that they make great marches in search of prey, as well protected from observation as the trains in our London tubes.

THE FIERCE ATTACK OF A HOST OF BLIND RAIDERS

Others, of the aphid-loving kind, run tunnels up the trees in which the honey-yielding cattle live, and bring them down into the citadel by these routes, or coolly wall in the aphides where they are, and keep the tunnels for their own lines of communication.

Terrible to all other life in the vicinity are the operations of the larger and fiercer ants. The Eciton ants are notorious for the extreme severity of their attacks on all other living creatures within their range of action. They clear their line of march of every living thing, as if a flame had swept it. Birds and beasts, every type of insect, are attacked and eaten piecemeal. Even creatures which feed on ants are overwhelmed by sheer weight of numbers.

Human habitations are not proof against them. The ants swarm through them, clearing every particle of food, every rat and mouse, every spider and fly, all the vermin which negligent natives tolerate in their homes.

The curious thing is that these ants are blind. They were sighted once upon a time, but their habits of dependence on touch and smell have led, after millions of years, to complete loss of the sense of vision yet with no perceptible diminution

of efficiency in the species. Perhaps our British ants, which obviously rely little on sight, will in time lose their power of eye, too; already their ocelli, the three little eyes which they carry in addition to the two great many-faceted eyes, have practically lost their original function through lack of use.

THE TERRIBLE ARMAMENT OF THE SLAVE-RAIDING ANTS

That is not the most salutary loss that ants sustain. As we have already said the social life of these insects resembles human civilisation in its worst vices as in the highest of its virtues.

It is obviously but a short step from the domestication and imprisonment of green-fly and other insects to a regular system of enslavement. Many species of ants are confirmed slave raiders, the redoubtable Amazon ants especially. They are formidably armed with great biting jaws, and their habit is periodically to send out scouts to adjoining colonies of ants of lesser force, then, at a given signal, to sally forth, thousands strong, to steal flesh and blood at whatever cost.

Added to their fighting qualities are military abilities of an impressive character. They attack the doomed citadel with a run and carry it by main force; or they surround it, place guards at every exit, then throw in what we must believe to be parties of picked fighters. Out come the rightful owners and battle is joined. The defence is hopeless. Soon the ground is littered with a horrible wreckage of ants bitten in two or torn to pieces. But while the fighters are thus wrestling in a death grapple, the raiders within are at the nurseries.

THE LAZY LIFE WHICH FOLLOWS A SUCCESSFUL RAID

Out they come, each one bearing an egg or a larva. When the home has been denuded of its infant life, the column is reformed and the living booty is carried back to the Amazon city. To what end? Simply that the larvae, waking to adult life in a hostile land, may know no other condition, but meekly accept bondage. They become the slaves of their captors.

Now there never was a condition in life which slavery did not undermine. Greece and Rome became helplessly weak through their dependence on slave labour and slave soldiers. The ancient Empires of the East rose and fell in tides, as slaves were many and faithful or few and

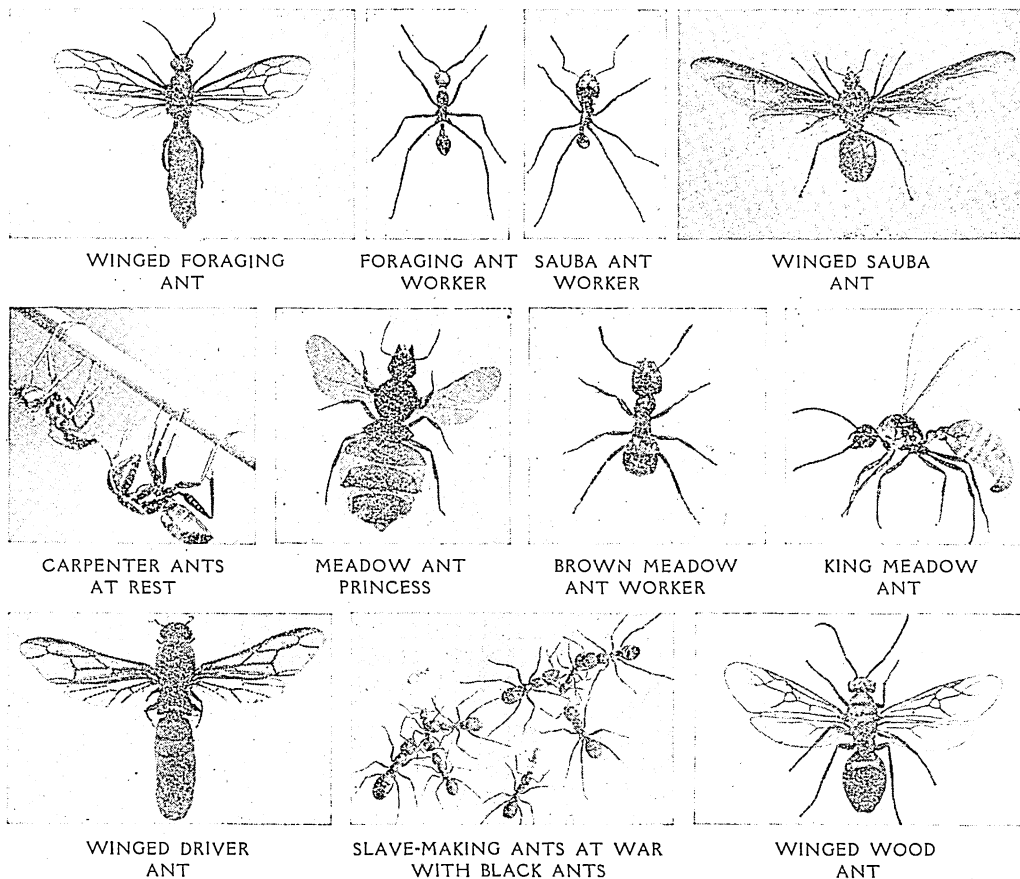
THE WONDERFUL ANT

unstable. Most of the dynastic tragedies in modern Oriental lands have sprung from the plots of slaves in the seclusion of the royal palaces.

And the greater the success of the raids of the slave-making ants, the more certain is the utter demoralisation of the conquerors. They cease to forage for themselves, leaving the task to their captives. They abandon habits of cleanliness, they neglect even to feed themselves, everything being done for them by their tireless slaves.

striking for the fact that the descent from pre-eminent fitness for existence comes about in the life, not of an almost everlasting species, but in that of an individual colony, an individual ant. Every ant born into the world appears a very darling of Nature, so amply equipped with gifts and cunning does it seem. We are always learning new things about these creatures, increasing our astonishment and sense of reverence.

For example, most of us were surprised, in the autumn of 1922, when a great French



When the home has to be changed, the slaves have to carry their masters, helpless as larvae. Left to themselves these conquerors, who slew citizens in thousands and wrecked strong places of defence, now starve and die, helpless if denied the daily service of the little slave ants to keep life in them by their ministrations. Self-help for ants as for humans has still its abounding merits.

Such a decline in skill, ardour, and independence as we see here, is the more

naturalist returned to Europe from Indo-China to reveal a supposedly new species of ants to the French Academy of Sciences, in which the soldiers, enormous creatures, bear on their heads great hollow horns through which, when attacked, they eject poison gas, a vapour of formic acid.

Four months later we had as great a surprise at home. Keeper Brow of the London Zoo's insect department, was cleaning out a nest of our common wood ants when lo, the ants began to bombard

him with what he thought to be the infamous tear gas of which we learned so much in the war. With streaming eyes he made tests and found that his charges were deliberately fumigating him with vapourised formic acid, after the fashion of the Indo-Chinese ants. And it proves that our species can discharge their irritating gas to a distance of over eight inches, about thirty times the length of the ant itself.

THE PROFOUND WISDOM WHICH RESIDES IN A TINY HEAD

If the old writers of fables which formerly served for natural history had known but a little of the ways of ants, what a literature of the impossible they would have added to the common stock of travellers' tales.

But indeed they could not much have exceeded the wonder of the reality. There is their sense of values, their method of communication, their memory, their delightful deeds of art, cunning, reasoned initiative, and skill, all mysteries to us still, because we cannot imagine how such profound wisdom can reside in so tiny a horny head. Let us finally group one or two disconnected feats in order to enhance our respect for these little people.

There were the ants which for several days had to climb down a string to a jar which contained sugar, but presently ceased their journeys, yet got the sugar. Only three or four ants made the whole trip. They brought grains of sugar up the string and dropped it to a ledge below, where the bulk of the ants waited to carry it off to their nest.

Then there was a tiny company of wood ants which sought to get a great horny beetle home to their larder. It was alive and resisting vigorously, but it moved in the direction the ants desired. Two were in front, hauling, and two were behind pushing, but as the ground was rough and the beetle's great legs waved and clutched, one could not understand how the tiny quartette were managing their huge burden. The mystery lay beneath, unseen. Underneath was a fifth ant, supporting the weight of the enormous body on its own.

THE WONDERFUL CLIMB OF A COMPANY OF ANTS

Best of all, perhaps, there is Mr. William Beebe's picture of a great company of fighting ants struggling out of a five-foot pit which they had cleared of life, beetles, other ants, spiders, grasshoppers, frogs.

The way up with their burden, he computed, was as if we had set men, each carrying a 200 pound weight, to scale a perpendicular cliff 1200 feet high.

It is a fascinating story, the way they did it, five columns strong, the majority heavily laden but with disciplined contingents thrown out to pick away loose grains of sand in the path that threatened destruction, to grip with feet and jaws and form living anchorages to which the toiling climbers could hold and climb over where places were smooth and treacherous.

But at the top of the ascent, the cliff, absolutely bare and slippery, overhung. Only a solitary ant could get up; the rest stayed, apparently defeated. But were they? No. The one successful ant was met at the top by numbers of other ants of the same tribe. There was a hurried consultation between the newcomer and the rest. Then there followed a rush of ants to the edge of the cliff. They formed themselves into a living mat, holding together one to another, each succeeding line of ants going lower and lower, as bees hang down in a skep hive, when about to form wax for their close-packed cells.

THE LIVING TUNNEL WHICH LED THE ANTS TO SAFETY

The living curtain hung several inches deep, when the lowermost ant with great excitement reached down its tentacles and touched the foremost ant of the column halted below. At once the ascent was resumed, aided by the ants hanging from above. The process was a sheer marvel of skill. The lower ants could come up only over the bodies of those hanging down, and that, seeing how they were burdened, was hazardous. So the hanging ants grouped themselves circlewise. They formed themselves into a tube. And through the centre of this tube, this tunnel of living ants, the burden-bearers from below, including one which hugged a morsel of frog, climbed up to the tableland above. Such marvellous things these insects do.

There is still much to ponder and perceive in the way of an ant. With its great achievements, its high efficiency, its affection for its own, its love of play, its lordly entertainment of dependents of other genera; with its limitations and native vices, it ranks foremost in its claims on the interest of everyone who has the gift of imagination.

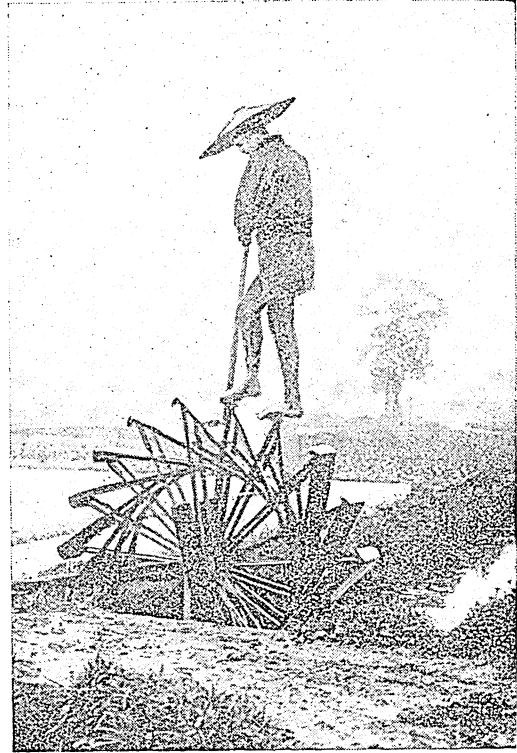
FAMILIAR THINGS
PICTURE-STORY OF IRRIGATION

This huge water-wheel at Hamah, in northern Syria, 75 feet in diameter (nearly three feet bigger than the Laxey wheel in the Isle of Man) is the largest in the world. The wheel runs without stopping day and night all the year round, and is used to raise water in buckets to the aqueduct for irrigation purposes.

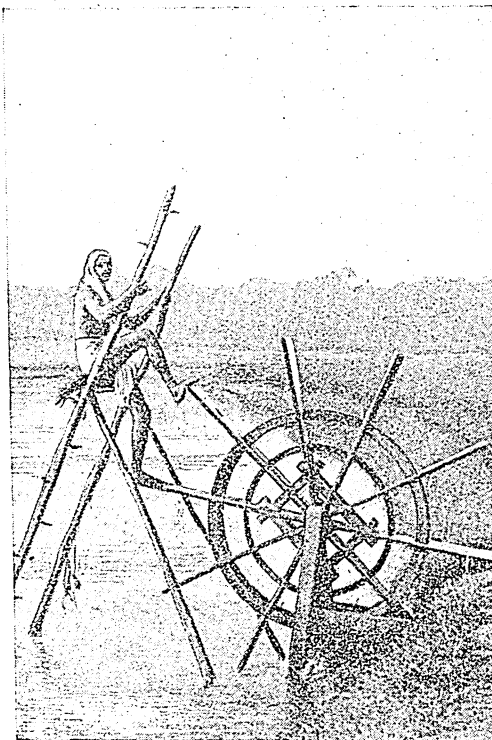
THE OLDEST WAYS OF IRRIGATION



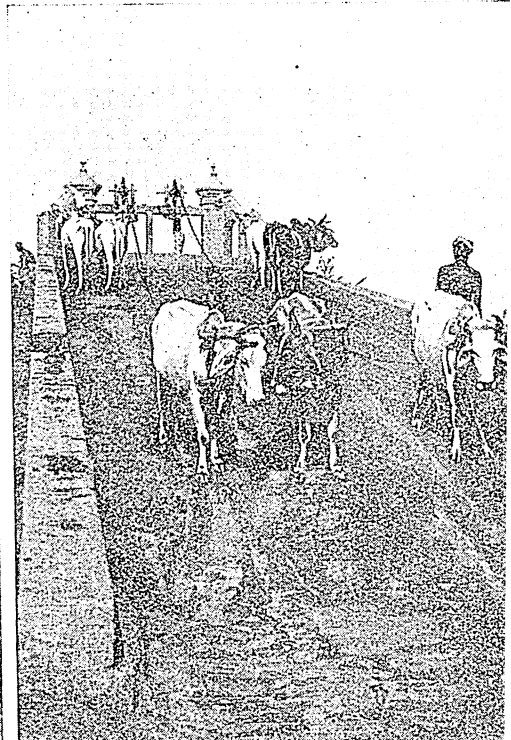
Here is a peasant in northern India raising water for irrigation by a lever arrangement known as a shadoof.



In the Japanese rice-fields much of the irrigation is carried on by means of treadmill water-raisers like this.

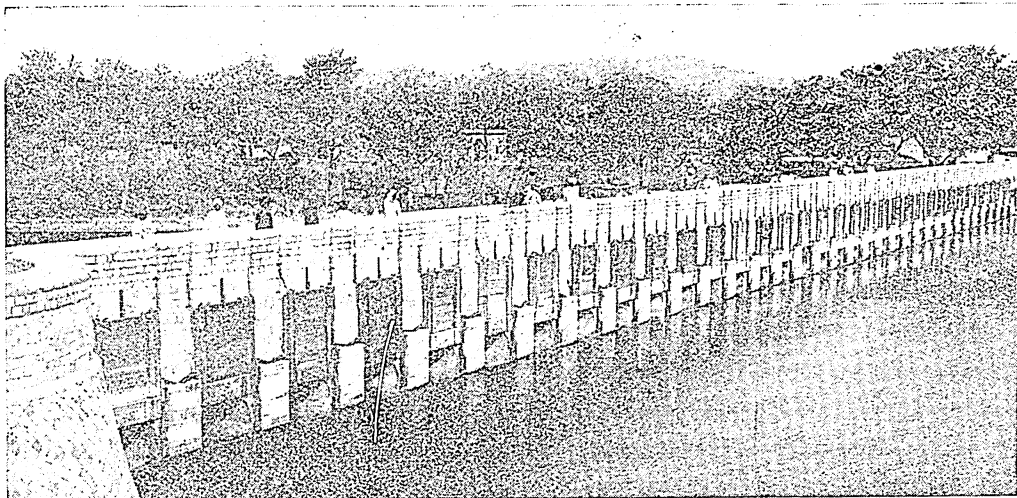


Here is another curious way of raising water by treadmill which is often practised in India by the natives.

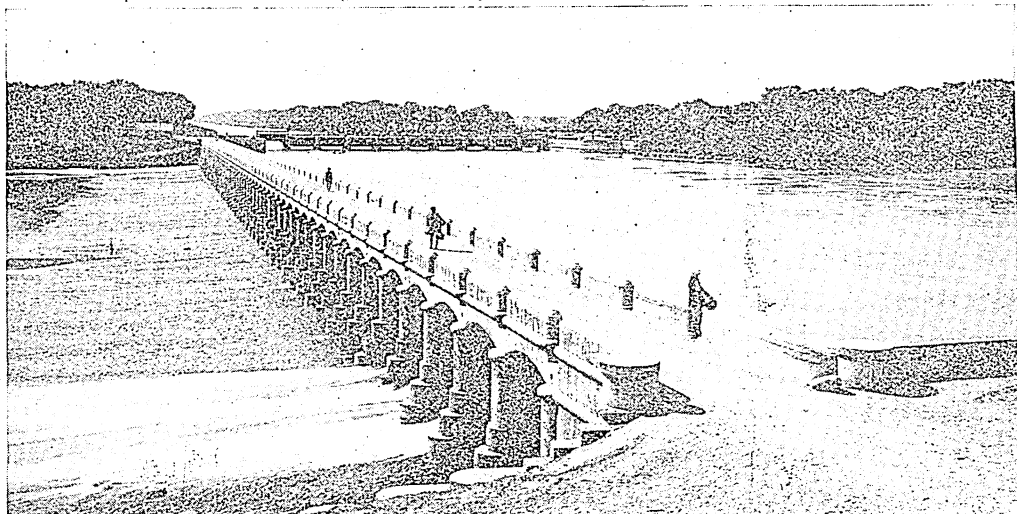


Sometimes animal power is used, as here, bullocks being driven down an incline to haul up water for irrigation.

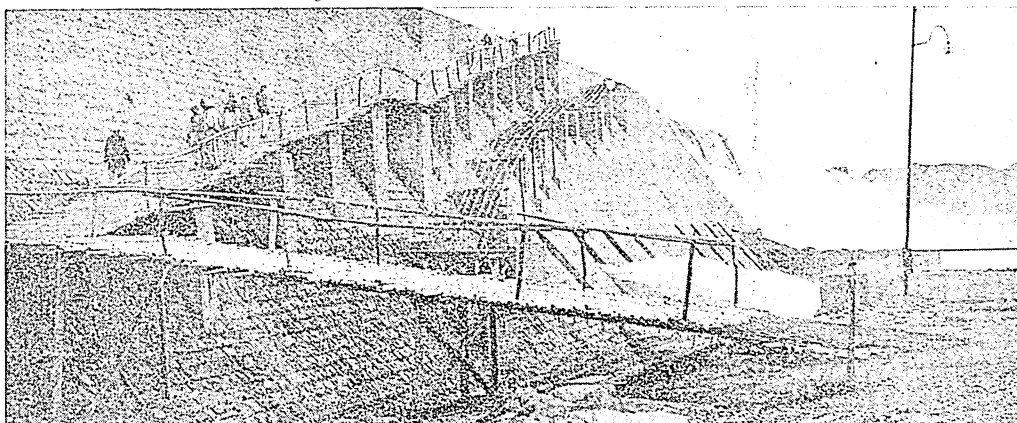
THREE GREAT DAMS IN INDIA



In modern scientific irrigation on a big scale a great dam of masonry is built across a river to hold up the waters and prevent them from running to waste. They are released as required. This dam is at Tajewala in India.

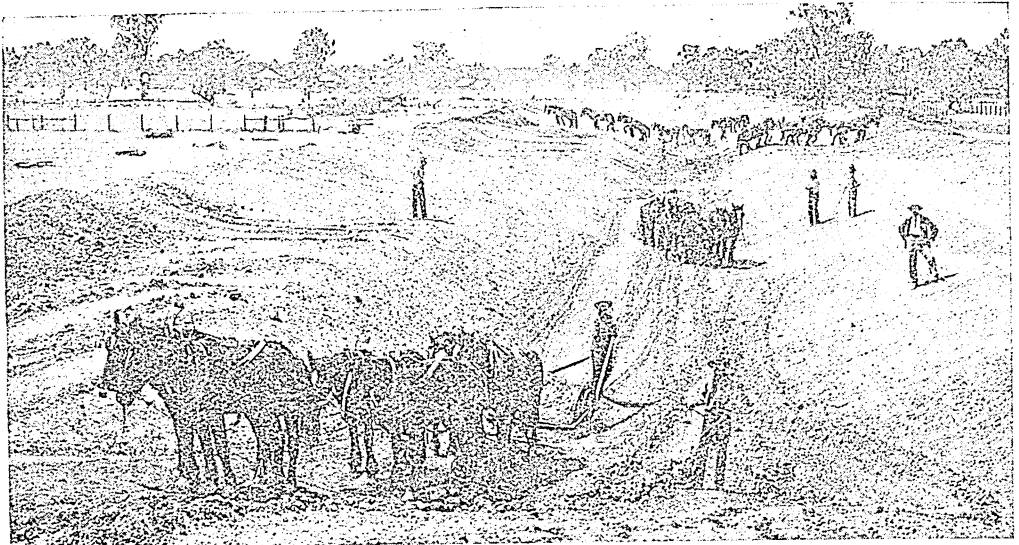


Here is another Indian dam at Dhanauri, which enables people to cross the Upper Ganges Canal, and at the same time regulates the flow of water from the reservoir in which it is stored.

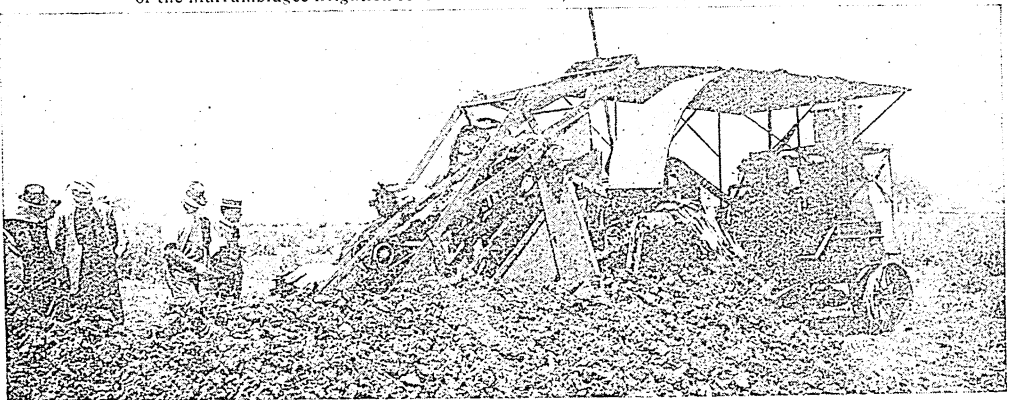


This dam holds up large quantities of water for irrigation at Krishnarajasagara, in Mysore, and, as can be seen, though the dam itself is a massive structure, the means of reaching the top is primitive.

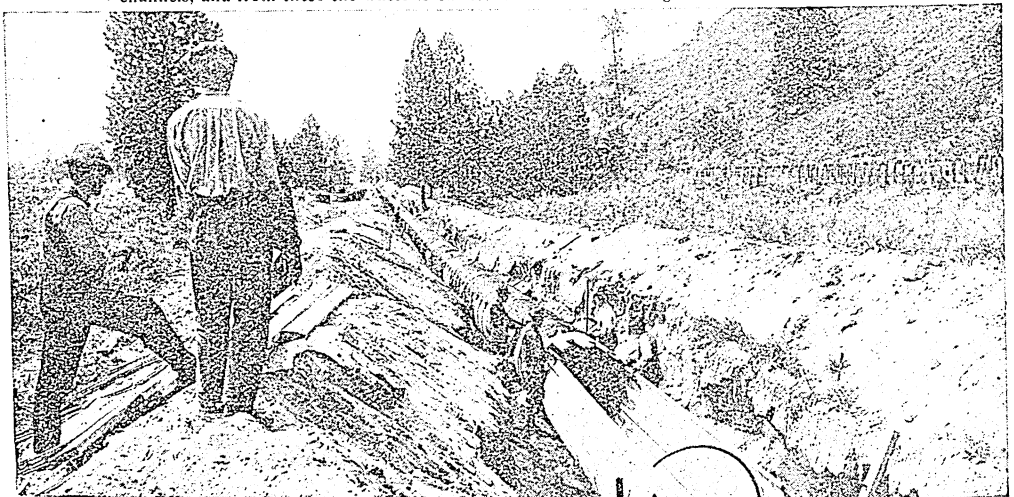
PREPARING TO DISTRIBUTE THE WATER



The holding up of river water by a great dam is only one part of an irrigation scheme. The water must be carried to the area where it is required, and for this purpose a trench or water main is prepared. Here we see the main channel of the Murrumbidgee irrigation scheme in Australia, 138 miles long, being hollowed out.



Where the ground is suitable, great mechanical excavators are used to dig the irrigation channels, and from these the water is carried to the farms through a network of trenches.

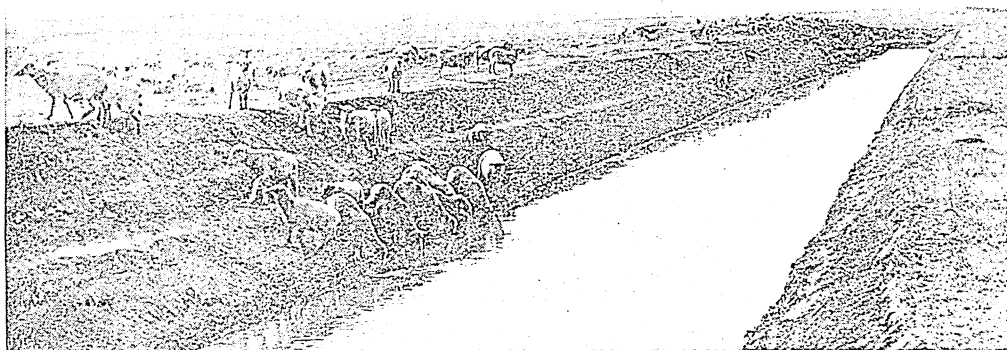


Where timber is plentiful wooden flumes or pipes are often laid in the trenches to carry the water, as is being done here in British Columbia. Iron rings inside and outside keep the planks in position.

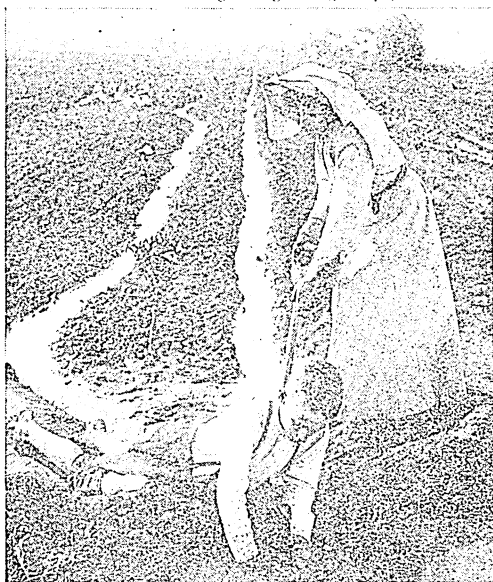
THE WATER IS CARRIED TO THE FARMS



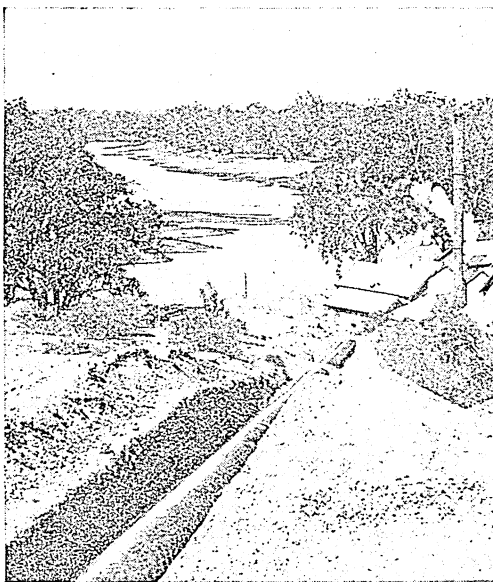
Through the smaller channels the water at last reaches the farms that need it. This is a photograph of a settler's home on the banks of a small irrigating canal in the Murrumbidgee territory of Australia.



Here is an irrigating channel in Canada, where the water is used not only for feeding the growing crops, but also as drink for the flocks or herds on the farm.

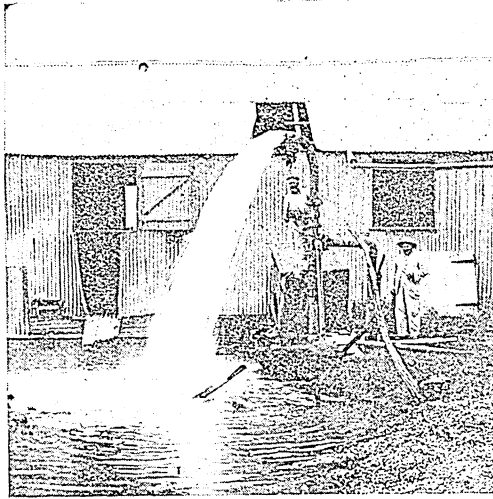


In the fields themselves the water runs in narrow trenches, as shown above, and it can be directed into these, or shut up by a mere turn of a spade.

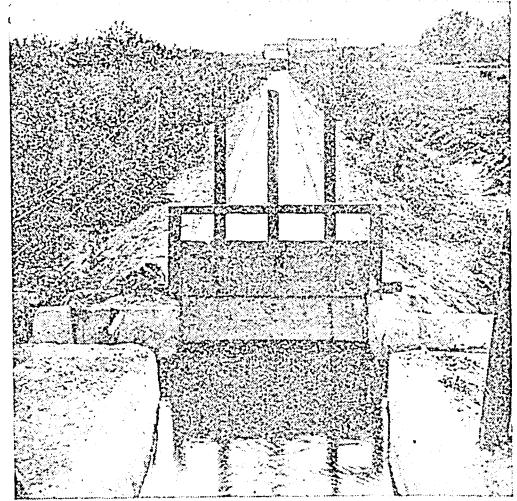


Where the water is at a high level it will run to the farms by gravitation, but in flat country it has to be pumped, and here we see a pumping station in Australia.

TAPPING THE UNDERGROUND WATERS



Nearly everywhere in Australia there are adequate supplies of water underground, but these must be tapped by artesian wells, as we see here.

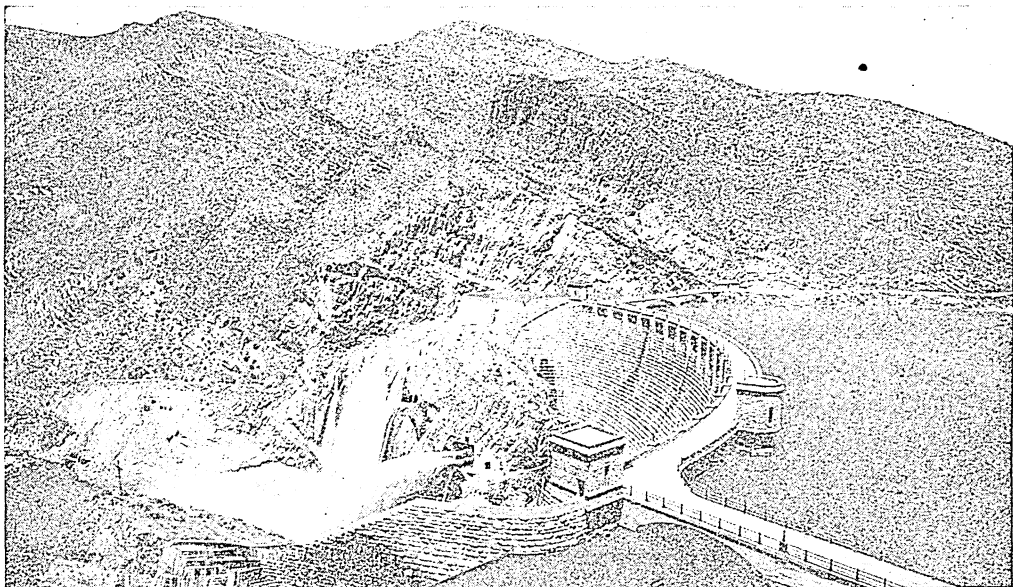


In the larger trenches on the farms there are sluice-gates, like this one in California, for regulating the flow of water into the network of smaller trenches.

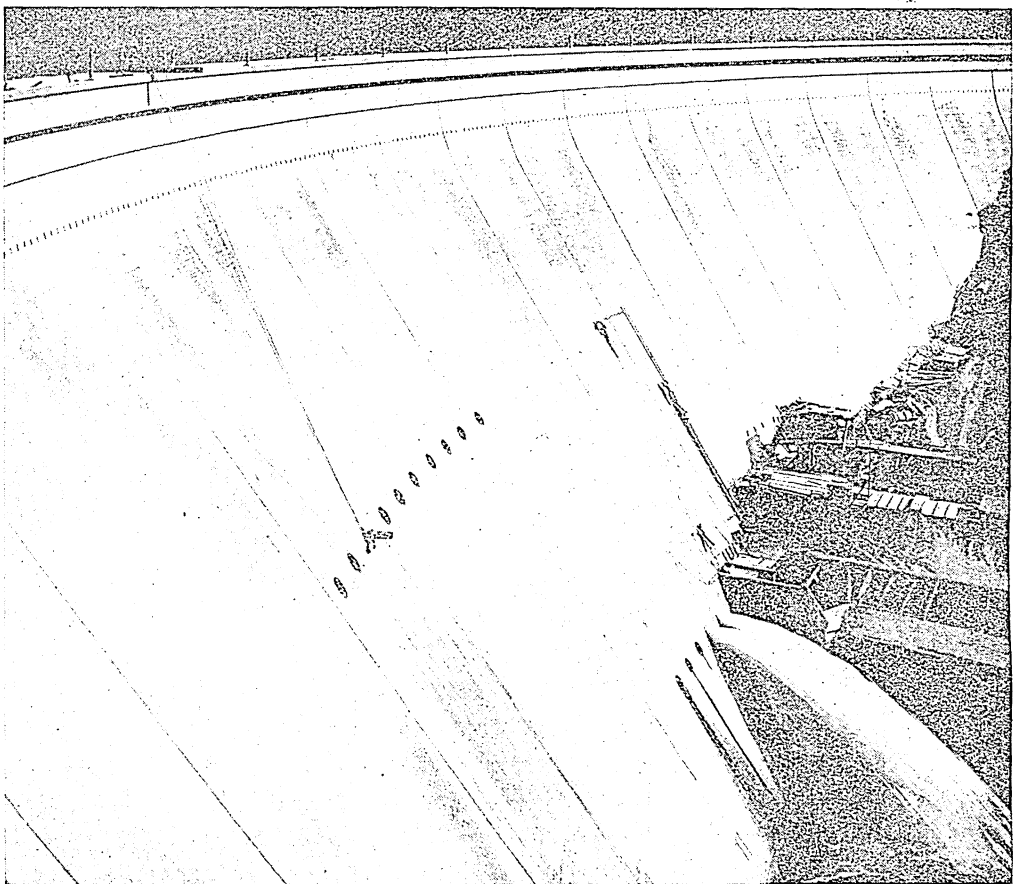


Sometimes the water is carried to the trenches through wooden troughs, as shown here. This walnut orchard in California was once a stretch of barren land on which nothing useful would grow, but irrigation has wrought a transformation

THE GIANT RESERVOIRS OF AMERICA

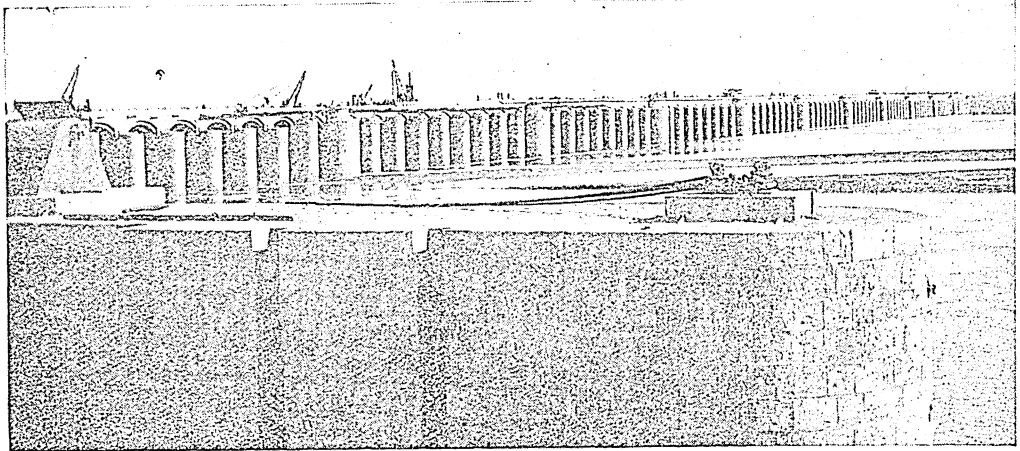


Some of the biggest irrigation dams in the world are found in America, where so much arid and desert land has been reclaimed. This is the great Roosevelt Dam, which holds up hundreds of millions of gallons of water in Arizona.

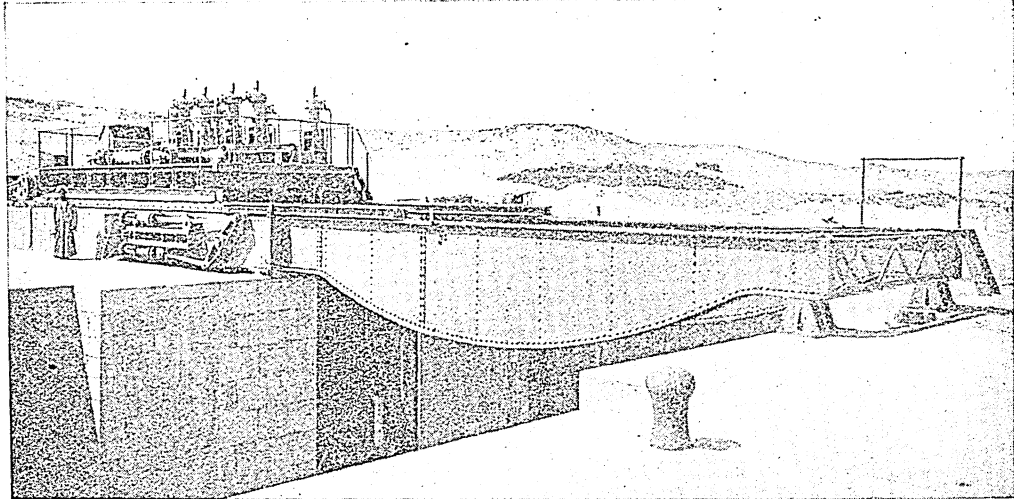


Another great irrigation scheme in Idaho includes the mighty Arrowrock Storage Dam, shown in this picture. It is 351 feet high, nearly as high as St. Paul's Cathedral, and is the loftiest dam in the world.

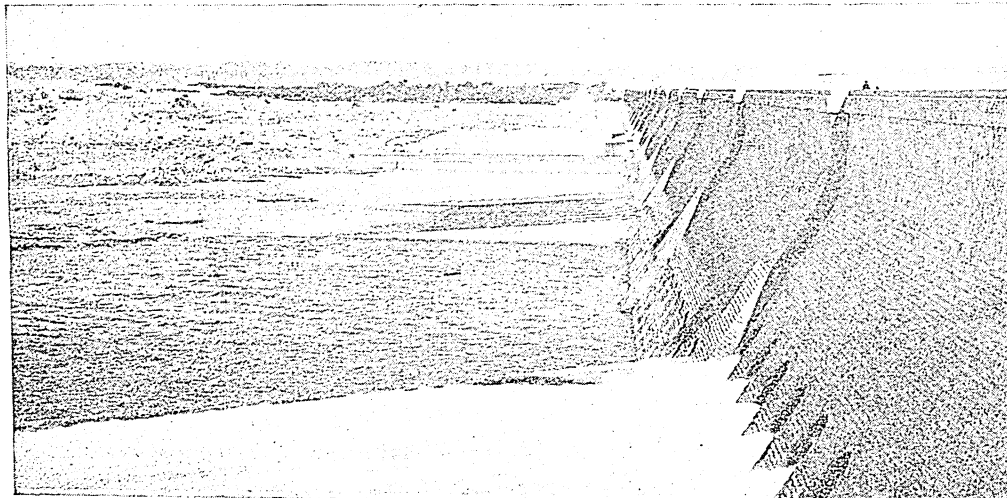
GREAT IRRIGATION WORKS OF EGYPT



One of the most remarkable irrigation works in the world is that on the Nile in Egypt, organised and carried out by British engineers. Here we see the great masonry dam at Assuan which holds up the flood waters of the Nile.



The stored-up waters are released as required through great openings in the dam, and the doors of the openings are so massive that enormous machinery like that shown in this picture is required to open and close each one.



Here is the other side of the great Assuan Dam, with the water rushing through some of the openings. The carrying out of this great irrigation scheme has meant plenty for thousands of people who might otherwise have almost starved.

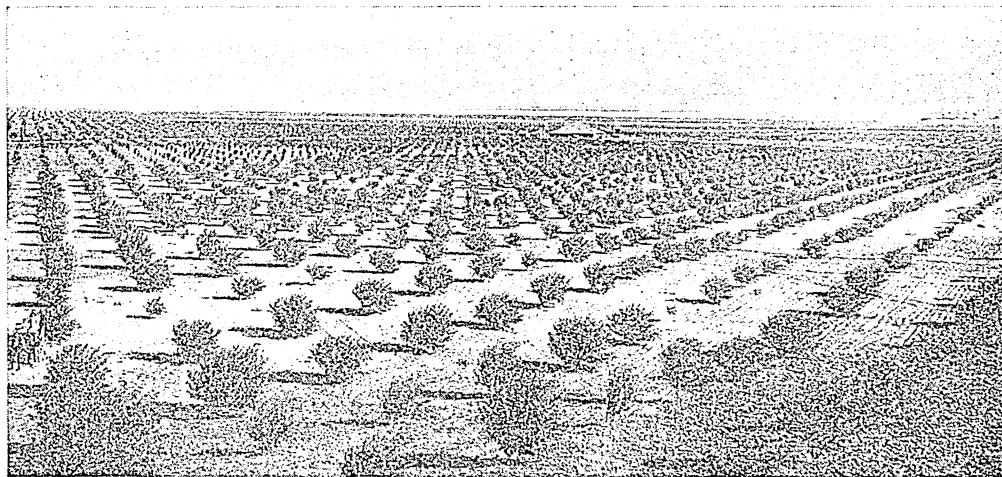
WHERE THE DESERT BLOSSOMS AS THE ROSE



The desert of the Rio Grande, in New Mexico, U.S.A., as it appeared before any irrigation works were begun. The soil is fertile, but the climate is arid, and nothing but useless scrub and cactuses could grow there.



Here is the same place after the great Rio Grande irrigation works had been carried out. The whole of a vast area was supplied with water, and every year thousands of pounds' worth of vegetables, fruit, and other products are grown.



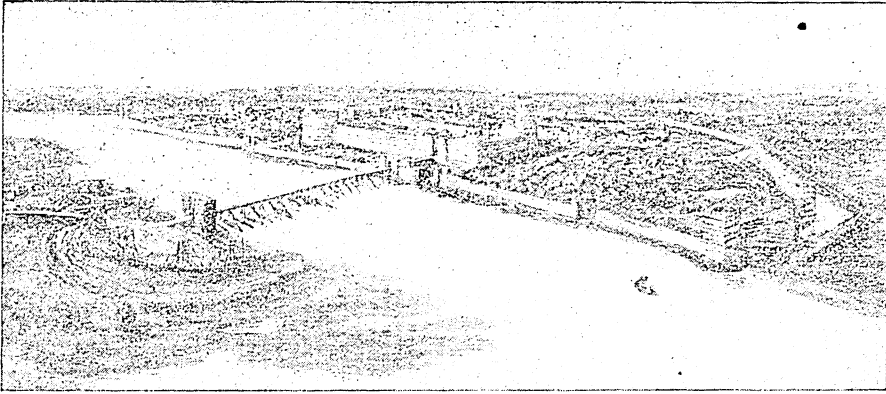
This is another example of how the desert has been made to blossom as the rose by means of irrigation. It shows a fruitful almond orchard flourishing in Colorado where formerly was nothing but arid wilderness.

THE IRRIGATION OF THE RICE FIELDS



IN JAVA RICE IS GROWN IN TERRACED FIELDS, WHICH ARE ABUNDANTLY IRRIGATED
The pictures on these pages are reproduced by courtesy of the Australian Government, the C.P.R., and others

Plain Answers to the Questions of the Children of the World



An artist's impression of London in Roman days

HOW DID LONDON BEGIN?

THE full story of the making of London can never be told. Its beginnings lie deeper than the fabric of the city. The London of today stands fully fifteen feet higher than the London Caesar knew. Waste and decay throw down matter, but do not destroy it. Rubbish collects and mounts, and buries a city beneath a city. Many successive Londons lie beneath the tide of modern traffic.

The makers of a city's unwritten history die, and with their voices records perish. As the old Londoners did not write, their narratives vanished with them; yet from the stuff of ruin we win here and there a little guide to strike light out of chaos. River mud and buried fragments yield from time to time a gleaming fragment into which modern learning is able to fit a tongue which sounds like a trumpet-call, a thrilling message from the dead past.

There was a London long before the Romans, and her sons were artists of high attainment. Two centuries before Caesar crossed our narrow sea there were men here working in metals with a skill and genius never excelled on the Continent of Europe. England had her copper coinage a century before Christianity dawned, and from the Thames has been rescued a shield from the Bronze Age as chastely wrought as anything produced by these wonderful

craftsmen of olden times before the dawn of learning in Europe.

Relics of those early days show us that London and the surrounding counties stood high in the cultivation of beauty before the Roman invasion of Britain. They show, also, that our beauty-loving Britons were in regular communication with southern Europe before Rome was a great Power.

Here, then, is proof that the Britons of old London were travellers, men whose lives were sufficiently safe, peaceful, and leisured to allow of journeys, of indulgence in fine art, and of that luxurious labour in which the artistic soul finds its delight. An age which produced intrepid travellers, fearless warriors, and highly-skilled craftsmen, must have furnished more than wattle huts and rude stockades for so great a city as the London which received the Roman legions. Yet we know practically nothing of it all. The name itself is Celtic, like the wonderfully worked metal the city entombs; and the name tells us that the site was fortified. We know that London was a rich city with a large population when Boadicea sacked and burned it nearly nineteen centuries ago. We know that the first Roman wall built to defend the city enclosed 380 acres, and that under the Romans London became the most important trading and financial centre of Britain.

FIRE · WIND · WATER · LIFE · MIND · SLEEP · HOW · WHY · WHERE

WONDER

If we credit the old Celtic Britons with ability to raise a London of some dignity, what must have been the nobility and splendour of London as the capital of Roman Britain during the four centuries of wonderful Latin rule here? Even of that stately period we have no record.

The Romans returned to Rome—probably in the year 418—to prop a falling Empire, and London was submerged by waves of barbarism. The great city disappears for two centuries, like a sun eclipsed. From time to time it appears like island peaks above a flooded country, from out the waste of savagery, but not until the time of Alfred does the historian set his feet on sure continuous ground. Then London rises from the thirty years of ashes to which the Vikings had reduced it, and from that time to our own, it has never lain at the feet of a Conqueror—for William the Conqueror did not take London; London took him. He was accepted by a vote of the citizens, on his promising to observe conditions which they laid down; and those conditions have never been modified in any reign.

We have peopled America and Australia on the terms that London demanded from the Conqueror. When Americans or Australians build a new city today, they know that every man in it will have the rights of a freeman, that every man will have the right to inherit his father's estate, and that the State will suffer no class to do them wrong. Those are the main clauses they unconsciously inherit as part of their birthright, because old London got them into the charter it demanded from Norman William nine centuries ago. No other nation has enjoyed such a schedule of foundation liberties as these which London taught all free men to demand.

Are There Flowers in the Antarctic?

While the Antarctic does not possess the abounding plant life of the Arctic, where at least four hundred species of flowering plants flourish, in addition to hundreds of lower forms, there are in the Antarctic many lowly mosses and seaweeds, and also two flowering plants. One of these flowers is related to our British wild campion and the other is a grass which was first discovered in the South Shetlands over a century ago, and has been found on the west of Graham Land, which faces Tierra del Fuego, and on one or two islands close by that projecting

point of the Antarctic continent. The campion-like plant has been found growing with the grass.

Owing to the extremely short Antarctic summer, and the low temperatures there, these plants are unable to mature their fruits, and so they do not reproduce their kind by seeds, but by vegetative processes, that is, by the development of cells which are actually a part of the general plant. In the Antarctic there are only four or five weeks in which plants can get the benefit of sunlight, and the ground is practically always frozen, so that there is not time for a flowering plant to complete its full cycle of life. Yet there are in the Antarctic fifty kinds of mosses, and over a hundred lichens. These, like the two flowering plants, mostly reproduce by vegetative processes. There are also about half a dozen liverworts, and about seventy species of seaweed. We know altogether about two hundred plants that contrive to live in Antarctica.

Who was Haroun-al-Raschid?

When Mohammed died, the Arabs entrusted the spiritual and temporal powers to district chiefs called caliphs, and their vast realms flourished for hundreds of years. Above all was the Caliphate of Baghdad under the reign of the great Haroun-al-Raschid, a contemporary of Charlemagne.

Haroun-al-Raschid was cruel. To secure his power he put to death all pretenders to the throne, and ruled by fear. Yet he was more than a tyrant. A learned man himself, he loved to have scholars at his Court, to encourage literature, the arts, any form of work that would improve the life of his people. So the Court of Baghdad led the world in the eighth century in rivalry with that of Charles the Great, Emperor of the West.

It was Haroun-al-Raschid who first thought of keeping up friendly relations with other rulers through ambassadors, although travel was extremely dangerous at that time. Haroun-al-Raschid was so eager to communicate with all the world that he sent rich presents to Charles the Great and invited him to Baghdad. The journey was never made, but it was so much desired on both sides, there was so much talk over it, that legends refer to it as if it actually occurred. It has been thought that The Arabian Nights had its inspiration in Haroun-al-Raschid's Court.

WONDER

Why Does Coal Burn and Not a Stone ?

The simple answer to this is that a stone is burned already and cannot be burned twice. What happens when a thing burns is that it combines with the oxygen of the air. When it has taken up all the oxygen it can, and has combined with it, it is completely burned and can burn no more. We watch a candle burning, and are deceived because we do not see the result of the burning. The result in the case of the candle is a number of gases which we do not notice, real though they be ; but when various other things are burned the result is not a gas at all, but sometimes a liquid and sometimes a solid. When the gas hydrogen is burned or combined with oxygen, it forms water, which is usually liquid. When the element silicon is burned or combined with oxygen, it makes a solid, and most rocks and sand are made of this. An ordinary stone or sand is really silicon which is already burned, and so can be burned no more. But coal is made mainly of carbon which is not yet burned, and so it can be burned. Burned carbon—that is to say, carbon combined with oxygen—makes the gas called carbon dioxide, which cannot be burned any more than a stone can, and for the same reason. Both are burned already.

What is the Use of our Hair ?

We inherit our hair from quite hairy, or even furry, creatures. Hair is a special outgrowth of the skin, and is a distinguishing mark of all the creatures called mammals, of which we are the latest and greatest. Fishes have scales, birds have feathers, and mammals have hair. We are much less hairy than our animal ancestors. Man has given up the use of things like hair and claws for fighting or defence, and has come to live by his mind. Still, we have a little hair left, and it is quite useful, and often beautiful.

Why Does a Face in a Mirror seem Crooked ?

We think that the two sides of our faces are just like each other, but every clever photographer knows that they are not. Ordinarily we notice nothing, but when we see anyone's face reflected in a mirror, then we see the left side of his face as if it were the right, and the right as if it were the left ; and as our eye is accustomed to the other thing, his face looks crooked. If you had never seen the person before, you would notice

nothing. You have never seen your own face except in a mirror, and if now it were possible for you to see your face as everyone else sees it, your face would look as crooked to you as the faces of your friends look when they are seen in a mirror. Of course, if the two sides of the face were exactly alike, the face would look just the same, whether seen in a mirror or directly.

What Do the Numbers on a Motor Bus Mean ?

There is a very interesting series of numbers on a London motor bus.

We all know that a motor-car must have back and front plates bearing the registration number of the vehicle, as we read on page 4994. This number is issued by the authority in whose district the vehicle is registered, and the initial letter or letters indicate the district, such as L.A., L.E., L.H., and so on, for London. All motors must also have the number on the Motor Car Licence, which is issued by the Inland Revenue authorities. This is contained in a small holder on the side of the bus just by the driver's seat, and the colour of the paper on which the licence is printed is changed each year, so that it can be seen at a glance if the licence has been renewed. A motor bus, however, has also several numbers not seen on an ordinary car. Just under the staircase at the rear of the bus is a white enamelled plate, with black lettering surmounted by the royal coat of arms. This is known as the Police Plate, and is issued by the police after the bus has been approved by them as suitable to ply for hire. This number also appears, with the words Metropolitan Stage Carriage, on other parts of the outside, and also just above the doorway inside the bus.

The London General Omnibus Company, which runs several thousand buses in and round London, has vehicles of many types, and it is necessary that each bus should have its own number for the convenience of the company. This is the number (such as B. 264, K. 34, S. 92, or N.S. 18) which is always screwed on the side of the bonnet, and is known as the Bonnet Number. This number appears in two or three other places on the bus. A small plate fixed to the panel on the near side of the body bears the Running Number, which consists of letters and figures, such as A.R. 16. The letters A.R. indicate the

WONDER

garage at which the bus is stationed, and the 16 is the place on the schedule for the route on which the bus is operating. The big figure above the driver, repeated at the rear of the bus, which is illumined at night, is the Service Number. In the London district there are many routes, and each route is numbered, so that if we wish to go from Victoria to St. Paul's, for instance, we know that No. 11 will take us. On the near side panel by the footboard is the sign, 12 m.p.h., which means that the speed limit of the bus should be twelve miles an hour. In a corresponding position on the off side panel, or just beneath it, is a table of letters and weights like this, which appears on the N.S. type of bus.

			tons	cwts.	lb.
U.W.	..	..	5	0	0
F.A.W.	..	..	3	8	0
H.A.W.	..	..	4	19	2

The first row of figures means that the bus weighs five tons when empty, U.W. standing for Unladen Weight. F.A.W. stands for Front Axle Weight, and three tons eight hundredweights is the weight borne by the front axle when the bus is fully loaded. H.A.W. stands for Hind Axle Weight, and four tons nineteen hundredweights two pounds is the weight borne by the back axle when the bus is fully loaded.

On the inside of the cab, near the driver, is painted the number of the body, such as 5979. Besides these numbers which all can see, every wheel, tyre, and component part of the bus bears a number, so that an easy check can be kept on the life of any part of the vehicle.

What are the Low Countries ?

The name Low Countries was formerly applied to the Netherlands or Holland (Hollow Land), of which Belgium once formed a part. It indicates the low-lying nature of the land, which is chiefly a delta formed by the alluvium from the great rivers, Rhine, Meuse, Waal, and Scheldt, which flow through it into the North Sea. Before England was separated from the Continent, nearly all Holland and part of the east of England were under water, making a great bay of the North Sea. As the sea gradually retreated northwards the Rhine flowed as far as Cromer to meet it. The hand of man has pushed the sea yet farther north, till now a quarter of the whole of Holland is below

what was high tide level at Amsterdam before the sea was banked up; and another eighth is less than 40 inches higher. The sea has been pushed back by the building of dykes. Dykes, too, enclose the rivers and lakes, and marshy lands are gradually being reclaimed by their use and turned into fertile fields. The same sort of thing on a much smaller scale has been done at the other end of the old "bay" in Lincolnshire, part of which is still called Holland. There are plans for reclaiming a great part of the estuary of the Wash in this way.

What is the Nobel Prize ?

Five prizes, worth several thousand pounds each, are awarded annually, under the will of Alfred Nobel, a Swedish chemist, inventor of dynamite and other high explosives. He made a fortune from the manufacture of these and, with his brothers, out of the Baku oil fields. Yet he was a lover of peace, and the most celebrated of the five prizes, the one people are chiefly thinking of when they speak of the Nobel Prize, is given to the person or society which in any year does the greatest service in the cause of international brotherhood, in reducing or ending standing armies, or in promoting peace. He died in 1896. Of the remaining prizes, one is for the most remarkable piece of idealist writing, and the other three are for eminence in physical, chemical, and medical science respectively.

Who was St. Patrick ?

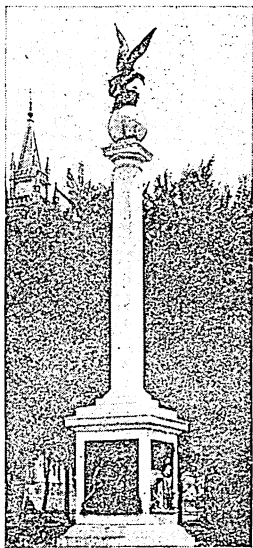
St. Patrick was the British saint who converted Ireland to Christianity. There were Christians in Ireland before his time, but they were accounted heretics and St. Patrick was sent to spread the true faith. He is said to have founded over 360 churches and to have baptised more than 12,000 people. Some hold that he was born in Glamorganshire and some at Kilpatrick on the Clyde. The date was about A.D. 390 when Britain was still in Roman occupation. While yet a boy he was carried off to Ireland by raiders, but escaped after six years' bondage. Later, as the result of a dream, he formed the ambition to return and preach Christianity to the Irish, but it was not till he was over forty that he was made a bishop and allowed to return thither, having spent most of the interval in study and meditation in Gaul. He was over seventy when he died near Downpatrick.

Who were Castor and Pollux?

In Greek mythology Castor was famed as a tamer of horses and Pollux as a great boxer. They reigned as joint kings in Sparta and had many heroic adventures. One legend makes Castor mortal and Pollux immortal, so that when Castor was killed and went to Hades and Pollux wanted to join him there, Zeus permitted him to spend alternate days in Olympus and in Hades. Their brotherly love was rewarded by their being made stars, and they figure still as the Heavenly Twins in the constellation of Gemini.

Is There a Monument to a Sea-gull Anywhere?

Yes, at Salt Lake City in the United States there is a monument to the sea-gull in memory of a fine service it once did to the State of Utah. The State was once invaded by a vast army of grasshoppers, which devoured every green thing in its path, so that the farmers despaired of saving anything from their crops. Disaster seemed imminent, but at the most critical time an immense flock of sea-gulls flew in from the Pacific, and settling on the area threatened with destruction set busily to work to eat up the myriads of winged pests.



The Sea-gull Monument

Does an Ostrich Hide Its Head in the Sand?

No; an ostrich does not bury its head in the sand. But an ostrich when in flight will sometimes sink to the ground in a heap. When they do so they are scarcely distinguishable at a moderate distance from the small ant-hills with which the African plains (where they flourish) are covered. The trick has been taught to them by a million years of experience in concealing themselves from enemies or disturbers of their peace; but when observed by early travellers in Africa it gave birth to the legend that the ostrich was convinced that it could not be seen because things were hidden from its own eyes. But the ostrich is not nearly so stupid as this suggests.

Why do People Use the Bearing-rein?

Poor people who have to groom and feed their horses, and so understand them do not use the bearing-rein. Only ignorant people and snobs use it. Sometimes people let their coachmen decide for them, and if the coachman is ignorant and stupid, thinking only about looks, and nothing about a horse's feelings, he may use the bearing-rein. Snobs use the bearing-rein to make their horses appear prancing, arch-necked, spirited steeds of great value, whereas, so far as money goes, they may be worth next to nothing. There are proper ways and means of making all horses, good or bad, look well—by feeding and grooming. But torture is not one of the ways, and whenever you see a horse with a bearing-rein you may know that its owner is either ignorant or cruel, or a snob or a brute. A horse with a bearing-rein, when it tosses its head is not showing spirit; it is showing that it is in agony.

Who Was Brahma?

Brahma, in Sanskrit, means the longing of the soul to rise to God through prayer. In a broader sense it is applied to perfection itself—or God. Brahminism is not a fixed creed born at a certain time; it is the slow evolution of the several beliefs of India towards a certain religious and social organisation.

Like all primitive peoples, the natives of India first worshipped Nature, and especially light, which they called Indra. Later they came to the conclusion that there must be a creative power, and they called it Brahma. This notable advance took place about 1000 B.C. Then, after the belief in Brahma the creator, came the belief in Vishnu, the preserver of the world, and in Siva, the destroyer. This triple god forms the Indian Trinity. That is why we never see Brahma, Vishnu, Siva, represented as three separate persons on statues and pictures, but in one body with three heads.

Brahma had four sons who were regarded as the fathers of the four hereditary castes of India. Outside those social divisions there are but the impure and the worthless. During the first centuries of our Christian era Buddhism, born about 500 B.C., triumphed over Brahminism in a great part of India. The worship of the god Brahma is not widespread, but Brahma as the one reality is a power in the religious life of the country.

Why Does Heat Crack Wood?

It would be easier to answer this question if more were known of the way matter is held together. If we knew why one end of a stick moves when the other is lifted up, we should have something to go on; but it is not easy to answer even that question.

There are two distinct problems to solve. One deals with the way in which things not made by life are held together, and the other deals with wood and other things made and built up by life. We know little of either of these, but rather more about living things than the others. At least, we can find something of their structure when we examine them under the microscope; and we can observe what are some of the effects of heat.

There is a good deal of water in wood. Now, water occupies space, and, like other liquids, will not be squeezed. When wood is heated and the water is driven off, this means that the whole balance of forces holding the wood together must be interfered with. Another reason why wood cracks when heated may be that the heat melts and destroys certain substances which hold the fibres together.

What Happens When our Foot Goes to Sleep?

This question concerns one of the most mysterious, most beautiful, and most wonderful things in the human body—the nervous system.

Our muscles, as we call the bands of flesh which move the different parts of our bodies, can only move when directed to do so by our motor nerves, which may be roughly described as telegraph wires between our nerve centres and our muscles. But before the mysterious order is sent from the nerve-centre along the motor nerve to the muscle directing it to move, the nerve centre has to receive a message from another and quite different nerve called the Sensory Nerve. Scientific men call this *reflex action*.

From the brain, or from the spinal cord (the big nerve which runs up the back-bone) motor and sensory nerves are connected to every part of the body. If a motor nerve is cut we lose all control of the part of the body it serves, but sensation remains. If a sensory nerve is cut we lose sensation in the part which it serves, but retain the power of movement. If both are cut we lose both sensation and the power to move.

Fortunately for us, serious damage to a nerve does not often occur, but not infrequently we experience what undue pressure on a nerve can do. If we sit on a chair so that a sharp edge presses the nerves of our leg we may easily find that our foot goes to sleep, as we say. What has happened is that pressure has affected the nerves serving the foot, and by compressing their fibres has made them incapable of transmitting impulses. On attempting to rise we cannot feel our foot because the sensory nerve has been pressed, and we cannot direct the foot to act because the motor nerve has been pressed. The foot is numb. Gradually the nerves recover as the pressure is removed, and we get the tingling we call "pins and needles" as the power returns.

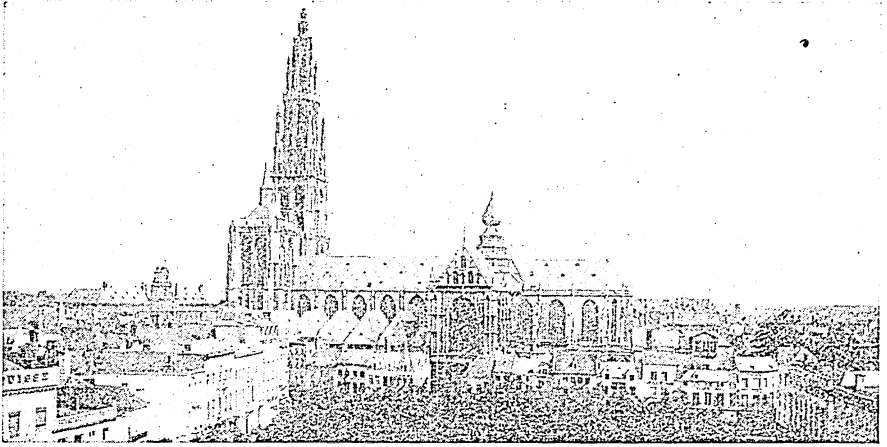
What is Daylight Saving?

In all civilised countries for years past people have been gradually keeping later and later hours, with the result that for half the year at least they have missed much of the daylight. In the bright hours of the morning they have been in bed asleep, and for hours after darkness has fallen in the evening they have been going about their business or pleasure in artificial light.

It was impossible to get the nations to change their social habits and rise and go to bed earlier; but an Englishman, Mr. William Willett, thought of the brilliant idea of changing the clocks during the summer months, and making us all get up an hour earlier, so as to seize another hour of daylight, while at the same time we were able to imagine we were rising at our usual time.

The question was much discussed in Parliament, but it is doubtful if the plan would have been adopted had not the war made it imperative to economise in artificial light. In the spring of 1916 the British Parliament adopted the scheme, and it has been repeated each year since. On a certain day, by Act of Parliament, all the clocks are overnight put forward one hour, so that people get up the next morning at what appears to be the same time, but is really an hour earlier. This artificial time, which gives an extra hour of daylight during the waking hours at the end of the day, remains in force about six months, and then, on a given night, all the clocks are restored to Greenwich time by having their hands put back one hour.

The Story of the Beautiful Things in the Treasure-House of the World



Antwerp Cathedral

THE GOLDEN YEARS IN EUROPE

THE growth of northern Europe during the Gothic centuries—the twelfth to the fifteenth—makes a most interesting story. But if we think we could say, after a summary of the ringing years wherein whole kingdoms changed hands and new ideas rose in men's minds, that "a number of cathedrals were also set up," we should be putting the case wrongly.

France grew up round the feet of her cathedrals like a family about its nurse's knees. Up to the very doorways welled the life of the little townships—tiny houses huddled together in the shadow of the high-flung roofs.

The first group of these great buildings was due to an extraordinary wave of creative energy and zeal that overran northern France in the twelfth and early part of the thirteenth centuries. It lasted for about two generations, and was something like a religious revival whose expression was rather in setting up houses of God than in saving souls. It is difficult for us, a fully developed nation, with our growing years long forgotten, and, moreover—regretfully we must say it—living in an age when only useful and money-making things are of any importance, to understand that fine flowering of the youth of the French nation.

The grand old abbey churches of Romanesque times had been built by monks and belonged to the monasteries. As the various States of France were being drawn into one kingdom, with Paris more and more the centre of government, a new spirit arose and a new power, the power and the spirit of people united by the interests of their own towns.

Each town, it seemed, cried out for a cathedral. Some one of the northern architects—no one will ever know at what minute in time's history or in what place in France the door opened on Gothic architecture—someone had somewhere found that the pointed arch could be flung up to any height, and that roofs set on intersecting pointed arches or vaults could soar like clouds above the plain.

This new kind of architecture exactly suited the ardent, adventurous people of young France. The men of a town said: "We must have a cathedral. And we do not mind if people say that buildings of the new kind will totter and fall. We will take the risk. And our cathedral shall be the loveliest in France."

An architect was summoned, and all he had to do was to build, and to master constructive problems. There was none of that tiresome estimating of costs to be

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thought of; the people saw to that. Stone in plenty, of a fine quality, was there to be quarried. Those who could not give money gave labour. "Whenever the great blocks of stone were hauled up by cables from the quarry, the people of the district, and even those of the neighbouring regions, nobles and commons alike, harnessed themselves to the ropes by arms, breasts, and shoulders, and drew the load like beasts of burden."

THE SPIRIT OF THE OLD CATHEDRAL BUILDERS

We are reminded here of a Bible story. Helpers came and encamped there, by the rising cathedral walls, and every now and again the masons laid down their tools, and a great company joined in prayer that this cathedral which they were raising to the honour and glory of God should be worthy of its purpose. They worked in season and out, giving service that was like good measure, pressed down and running over.

In such a spirit did these first Gothic cathedrals rise on the barren shore of French towns. A flame of ardour so generous must needs burn itself out. A century after these people prayed among their stones, cathedrals were being set up by men who were summoned to work; some of them were built by forced labour.

But in the meantime, while their first cathedrals were building, the townsfolk watched eagerly for such part as might be finished in their lifetime. Additions were made later, an extended choir here, a chapel, a transept, there. The decorating with sculpture kept hundreds of people eager and happy. But as soon as the bones of the cathedral were put together, so to speak, as soon as the house of God had roof and walls, doors, and an altar, it was opened with joy unspeakable. The townsfolk remembered to their dying day the first time praises were sung under those great echoing arches, which seemed themselves to hold up their pointed hands to pray, to catch the benediction and toss it down again to the crowds, tiny, and awestricken, in the nave.

THE STORY OF THE BIBLE IN THE WINDOWS OF OUR CATHEDRALS

To the people, unlettered, superstitious, their cathedrals were more than the centre of town life, their pride and joy, the thing that they had made. They were like huge religious story books which the most ignorant could read. On the outside of

the fabric they could see numberless figures of saints and holy persons, and learn from their attitudes and their emblems something of the reward of goodness. There were also figures of less happy individuals to whom a just punishment had been meted out.

Inside the buildings the lovely golden light of stained glass drew their eyes; and there, rank upon rank, was painted the heavenly company. The whole story of the Bible peeped out as men passed from window to window.

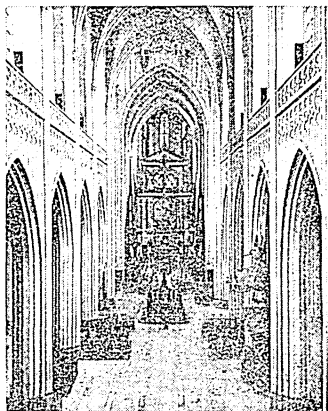
No peasant ever forgot the Old Testament tales and the Gospel lore learned from the cathedral pictures, and you may be sure that boys and girls growing up in those days, with no ideas in their minds got from books, were quite clear about the doom that lay in wait for the wicked, and the reward of piety. They were as sure on that point as on the number of pinnacles and decorations added to the cathedral since they themselves were three or four. They listened, grouped round the skirts of their elders in the Place, or Cathedral Square, to rare travellers who had come in from one of the highways of Europe and had met with many adventures and had seen great abbeys and churches. The little ones stared up at their own buildings and knew no other could be so fine.

THE CHANGE WHICH CAME OVER THE OLD CHURCH OF ST. DENIS

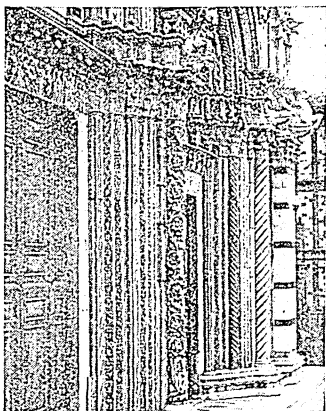
While in various places in northern France these monuments of the new art were rising, some very memorable work was being done in Paris, both in the precincts of the old Romanesque abbey of St. Denis, and in the cathedral of Paris, known all over the world as Notre Dame. In the hands of the builders, St. Denis slowly changed from Romanesque to Gothic form. Its Gothic was very simple, as nearly akin to Romanesque as two different styles could be. We are very thankful that the lovely old Romanesque crypt was left, with its pure round arches.

One of the grudges we have against Gothic builders was their inability to let well alone. They had wonderful ideals for new buildings; it was a pity they thought that nothing which was not in accord with their new ideals was fit to exist. Therefore they callously pulled down the Romanesque churches, sometimes to use stone for the new buildings, sometimes because they were weak, and

BEAUTIFUL ARCHITECTURE INDOORS AND OUT



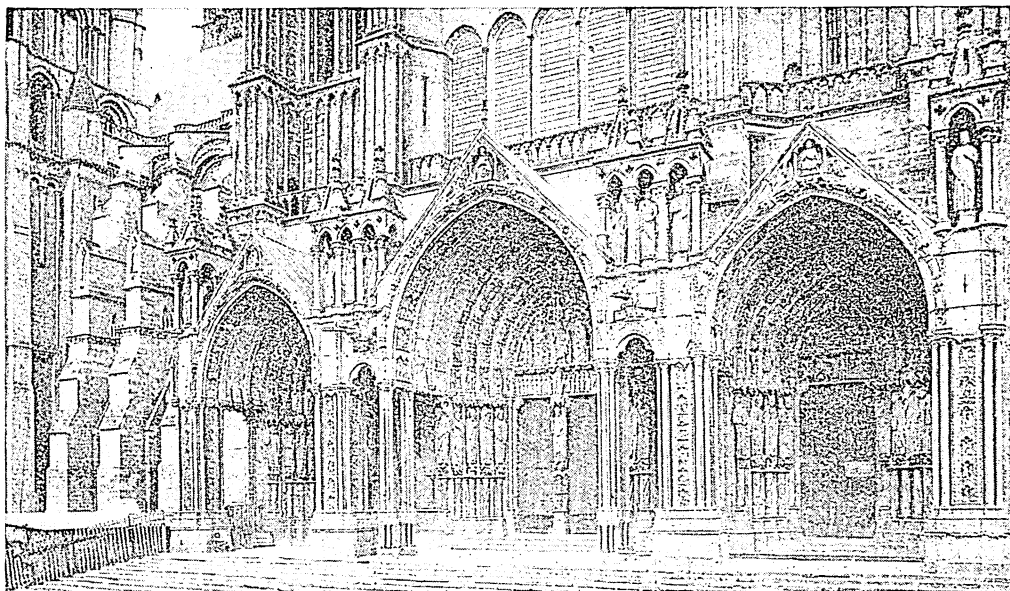
THE NAVE AND CHOIR OF
ANTWERP CATHEDRAL



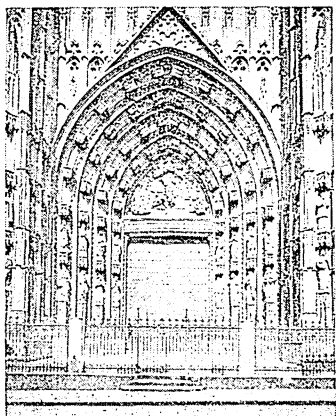
DETAILS OF THE FRONT OF
SIENA CATHEDRAL



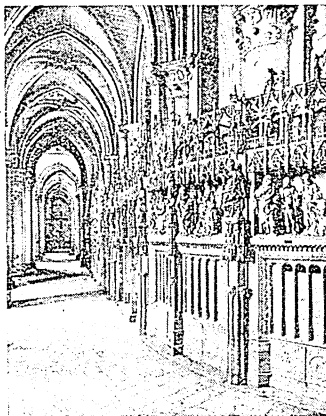
THE CHOIR AND ORGAN IN THE
GREAT CHURCH, HAARLEM



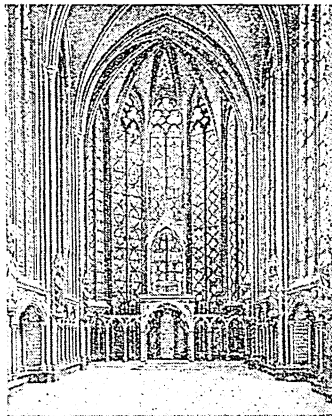
THE SOUTH ENTRANCE TO CHARTRES CATHEDRAL



THE GATE OF THE KING
IN SEVILLE CATHEDRAL



THE AMBULATORY IN
CHARTRES CATHEDRAL



THE LOVELY WINDOWS OF
SAINTE-CHAPELLE IN PARIS

needed strengthening, sometimes out of sheer egotism. The result is that only here and there can we see the work of some of the earliest Christian builders of Europe. But this scant reverence for the work of the immediate past is a human trait we are constantly meeting.

THE GREAT PARIS CHURCH WHICH WAS A CENTURY IN BUILDING

In 1163, very soon after the Gothic choir was consecrated in the abbey church of St. Denis, the foundation stones of Notre Dame were laid. The building of this cathedral covered about a hundred years. It shows something of the simplicity of the Gothic work in St. Denis. It is sturdy, like the Romanesque, as if builders had still not forgotten, in spite of themselves, the tenets of their old faith. They were afraid to fling their arches too high. They set them on enormous pillars, carried them up to the blind-story, rested in solid masonry, then threw up more arches, rested again, and finally reached the vault lines.

This early vigour has happily not been lost in succeeding generations, and at the hands of numerous restorers who worked on Notre Dame in the nineteenth century. The foundation of the cathedral strikes into the roots of a very old Europe. It was built on the site of a heathen shrine which in the fourth century became a Christian altar.

The façade, or chief front of Notre Dame, is one of the noblest productions of early Gothic art. It has the same solidity and clearness of arrangement that marks its interior. Romanesque architects, we know, had derived much of their art from Classical buildings; these, in turn, had sprung from the Greek architecture, which was so measured and logical that if one only saw the base of a column one would know the proportions of the whole building.

THE SEVERITY AND SIMPLICITY WHICH GIVE CHARM TO NOTRE DAME

From this rock foundation of style, Gothic architecture was destined to take a very wide leap. As we noted in our talk on English Gothic, no two cathedrals are exactly on the same plan or proportion. It happened sometimes that two resembled each other; but, generally speaking, from the end of the first period each Gothic building was a separate adventure.

The façade of Notre Dame is in form nearly a pure letter H. Its severity and simplicity has great charm. We feel very

glad that the twin towers which finish off that part of the roof covering the side aisles have never, in the fever of a later period, been decorated or added to. They are just right; the architect who ended the towers in that uncompromising, horizontal line had a very fine taste. The apse was thrown out, chevet form, a French characteristic we have already noted, with very strong flying buttresses. At a later period the spaces between these buttresses were used for the building of little chapels.

The cathedrals of Lens, Laon, Senlis, Noyon, all begun about the middle of the twelfth century, have something of the simplicity of Notre Dame, Paris. They mark that period of early French Gothic which is generally called Lancet, and ends about the close of the twelfth century. The windows of buildings of this style are simple, with geometric tracery.

The work of the thirteenth century, marked by a development in height and general grandeur, was called Rayonnant. This name was taken from the huge circular windows with wheel-like traceries that marked the cathedrals of the period. In the fourteenth and fifteenth centuries Flamboyant Gothic ran its course in France, characterised by the flame-like, wispy traceries of the windows.

THE WONDERFUL CATHEDRAL AT BEAUVAIS WHICH IS STILL UNFINISHED

It seemed that when the early twelfth-century cathedrals were in course of construction, architects began to think how much further they could go on the same lines, developing the Gothic idea. They began to have a yearning for tremendous height in the naves and choirs. In some cases, like that of Beauvais, the builders were too daring; their choir just dropped in. The choir was restored, but the cathedral remains unfinished to this day, is but a glorious fragment consisting of a choir and a transept. It has nevertheless a very wonderful south doorway, with a great rose window, and the carven doors are a miracle of beauty. They are by Jean le Pot of Beauvais, and are supposed to be the finest doors in the world.

The maker of the cathedral of Chartres succeeded in setting up a very lofty building on more sturdy lines. The nave is an interesting development from that of Notre Dame, but the outside gives an effect of rather tumultuous strength; there are too many buttresses.

THE GOLDEN YEARS IN EUROPE

From the façade of the cathedral we can see at a glance that the building was begun in Romanesque times. Curiously over its round-headed porches is set the wheel window of Rayonnant Gothic. At a later period the Romanesque towers were carried up into Gothic spires. The north and south porches of Chartres are among the finest pieces of Gothic work in France.

WHY GOTHIC IS CALLED A RESTLESS STYLE OF ARCHITECTURE

Bourges Cathedral, remarkable for its heavily sculptured façade with five doorways flanking each other, is a development of another kind. There are no transepts, and thus the building makes a long, unbroken line. In Le Mans Cathedral the architect seemed to think more of the chancel than the rest of the church. It has double aisles, and from them open out thirteen chapels. So that inside, the eye can find no rest, no final lines, and outside, the body of the church seems dwarfed behind the monstrous flying buttresses and the projecting masses of the chapels.

We need only look at a photograph of the apse of Le Mans Cathedral to see all that Gothic architecture might be, and all that it is not. And we can quite understand, if we have not already done so, why it is called a restless architecture.

In the nave of Amiens Cathedral, which is one of the loveliest in France, the architect succeeded in realising his dream of height. It is a very wonderful feat of constructional skill, with scarcely a line to break the soaring pillars and arches. When we look at it we can understand why at one period the ignorant folk of France, terrified at such audacity in the way of building, made up stories about architects being in league with the evil ones, and having sold their own souls as a price for their cathedrals' amazing height and slenderly balanced interiors.

THE GENIUS OF THE SCULPTOR IN THE FAÇADE OF RHEIMS CATHEDRAL

The cathedral of Notre Dame at Rheims, for so long the coronation church of French kings, is one of the most powerful productions of medieval Europe. It has a huge, broad nave, where immense crowds could gather on great days. It was planned more or less on the lines of Notre Dame, and its façade somewhat resembles the Paris cathedral. But Rheims grew up, so to speak, in the more florid days of French Gothic, and the simple grandeur of its structure is hidden.

Although each cathedral was different from the other there was a certain unity in the work of the architects of northern France. Some façades are more gorgeous in adornments than others. The front of Rheims is one great glory of the sculptor's genius in those days, and its pillared, bodyless towers and dainty wheel window give an ethereal look to a very powerful structure. In other façades, notably that of Bourges, the sculpture clings round the great doorways, and the upper part is barer. In several cathedrals a curious look is given to the façade by the towers of different periods and varying form and height that adorn the same building. Rouen Cathedral looks, from the front view, as if all its parts do not belong to each other.

As we noted in our study of English Gothic, the French cathedrals were generally carried so high that they could not support the weight of a tower at the crossing of the nave and transepts, as in the case of the British cathedrals. Sometimes they had a short spire—the highest is the slender shaft of Amiens, added in the early sixteenth century. In some of the churches of Normandy, which were nearest akin to the English, there were central towers, like the one in Rouen Cathedral. For the most part French architects concentrated their interest in towers and spires to the chief front of the cathedral.

THE BEAUTIFUL LITTLE CHURCHES IN THE TOWNS OF FRANCE

The Norman buildings strike a severer note than those in the rest of northern France. At Coutances, Bayeux, Mont St. Michel on the Brittany border, at Quimper, churches and cathedrals are marked by plainer, more soaring lines. Mont St. Michel is especially famous for its magnificent monastery buildings set within its fortress-like walls. In a great many towns of France smaller churches appeared, some of great beauty. The finest of them all is the Sainte Chapelle of St. Louis, in Paris.

In northern France, the cradle of Gothic architecture, the new art grew and expanded, changed its form, was enriched and made complex as the taste of its builders dictated. It had next to no opposition in the way of established architecture. As we go south we see a curious change. The Loire was the northern boundary of the stronghold of Romanesque art, and here pure Gothic

has not complete sway. Indeed, faced by that glory, the abbey church at Cluny, one wonders that the people of southern France tolerated Gothic architecture at all.

The cathedrals and churches that were set up south of the Loire were a compound of Gothic and Romanesque. The most famous are the cathedrals of Albi and Carcassonne. Poitiers Cathedral is an interesting specimen of Gothic-Romanesque; that of Bordeaux shows more Gothic than any other—one of the few cathedrals with flying buttresses in the south of France.

THE UNFINISHED CATHEDRALS WHICH WERE STARTED CENTURIES AGO

Bayonne Cathedral, built in part on the ruins of an earlier erection, and still unfinished, shows some northern Gothic work, and has the remains of a fine thirteenth-century cloister. The cathedral of Toulouse is a strangely hinged-together church, and this also is unfinished, though the nave dates from the same period as the Bayonne cloisters. But, however skilfully finished, it can never have the same merit as St. Sernin's, the Romanesque church in the same historic old town, built and finished and its period rounded up before the Gothic cathedral, St. Stephen's, was thought of. Rodez is another wonderful church of the south, its naked-looking walls making a kind of huge pillar support for the sculptured towers of various periods surmounting it.

The farther south one goes, the plainer, more restful is the architecture. The builders disliked flying buttresses and disliked the idea of the nave being so much higher than the side aisles. They, therefore, carried them up almost the height of the whole building, and broke their walls with long, slender windows. The roofs were almost flat, and generally beautifully finished with parapets and small pinnacles; there was often a simple tower reminding one of the campanile of the earlier century. The result was a mixture of dignity and severity. Albi Cathedral is called a fortress church.

THE SOMETHING HUMAN AND VERY CHILDLIKE IN FRENCH GENIUS

When the last phase of Gothic architecture appeared, it pleased one of their builders to add to this grand, majestic old church at Albi a most delicate Gothic porch, full of dainty lines and the chasings of the Flamboyant period.

There was always something very human, and a little child-like, in the French Gothic genius. When once its first spiritual ardour was sped, when it no longer flung itself skyward, it wandered about very happily, making beautiful things. And it seemed that no later architect could view the work of an earlier generation without wanting to make his mark on it, too.

By its nature it was an elastic art. There could always be another chapel added to a cathedral, another set of pinnacles, or a doorway, with its scope for limitless sculpturing; or the head of a tower could be taken off and its body carried higher, or another tower added.

Before the fifteenth century expired, architects seemed no longer capable of the long "drive" necessary for setting up a big cathedral or church. They were content to work, in unending elaborations, on a piece of one. They were so engrossed in making a porch or a tower look like lace work that a building as a huge scheme was impossible to them.

THE TREASURE-HOUSES OF THE ART OF THREE RICH CENTURIES

This same decorative rather than constructional skill, had always found scope in the interiors. Long books could be written about French cathedrals, without once mentioning structure of walls and roofs, and the problems of architecture. They became treasure-houses of the art of three rich centuries. Their little and big images and statues, their tombs, their rood screens, grills, and beautiful doors with wrought hinges, their chancel stalls and bishop's thrones, their altars and side altars—on all these a minute and wonderful skill spent itself.

Gothic art ran its course throughout civilised Europe, in Spain, Italy, Germany, the Netherlands, Austria, touched Sweden and Hungary, but nowhere had it such a magnificent field as in France and England.

Strasbourg, one of the finest of the French cathedrals, was built in the second half of the thirteenth century, and added to in later periods. Its erection coincided with the rise of Gothic architecture in Germany. Thus, a hundred very wonderful years had sped after the beginning of Notre Dame, before churches in the new style were set up east of the Rhine. Romanesque architecture had a hold there, and Gothic was not welcomed.

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For a long time buildings were a mixture of the two styles. Limburg Cathedral and the Liebfrauenkirche, Treves, are fine specimens of the work that was done in transition from Romanesque to Gothic. The most interesting church of the two styles is St. Gereon, Cologne, which is built on an ancient round tomb-house.

THE STYLE THE GERMAN PEOPLE LIKED IN THEIR CHURCHES

The German people kept their love for the many-apsed churches, and they also, in some cases, adopted the French style of the chevet. Their churches were variously planned, the work of each province differing a little from the next. Like the southern French, they often preferred aisles and nave of the same height, and consequently many of their churches have no clerestory and no blind-story, and are of the type known as the "hall" church.

In northern Germany brick was mainly used, but, in whatever medium, the workmanship was good, in many cases atoning a little for poor design. The grand western façades so usual to French Gothic never became a feature of German cathedrals and churches. Their porches are often set north or south, and are rarely imposing.

St. Elizabeth, Warburg, built in the thirteenth century, is an excellent example of the hall churches with many apses. The Frauenkirche, Nuremberg, built a century later, is a fine old hall church with a quaint two-storied porch, in which is set the famous clock that starts the figures of the seven Electors in movement about the king when the noon hour strikes. Munich Cathedral is also of this hall type, and many churches, like St. Lambert, Hildesheim, and St. Stephen, Mayence, and St. Stephen, Vienna, with its fine spire.

THE BEAUTIFUL GERMAN CATHEDRAL BUILT IN THE FRENCH GOTHIC STYLE

The cathedrals of Freiburg, Ratisbon, and Ulm were all built in the thirteenth and fourteenth centuries and added to later.

Cologne Cathedral is the finest example of French Gothic in Germany, and it is the largest cathedral in northern Europe. It is imposing, but not great, because its proportions are wrong. The French Gothic builders know by instinct how wide a church should be in relation to its length, and just how much weight should go into the transepts and aisles. Here

the German architects, building in the French style, were at fault.

They made their double side aisles as wide as the nave, so that the cathedral has far too much width to carry for its length. They also made their twin towers too huge and too high, five hundred feet, so that they overbalance the rest of the building. And in the decoration of the towers their artistry was at fault. They lacked the dainty ingeniousness of the French sculptor.

The secret of the failure of Cologne Cathedral, imposing as it may be, is that it was built by a people to whom Gothic architecture did not really appeal. They obeyed its rules, but knew not its spirit. Their art did not express itself in that way. To them Gothic architecture was a music for which they had no ear.

The technique of their workmanship was excellent. As craftsmen they were hard to beat. They must have carved lovingly their woodwork and stonework, so closely imitative of nature's form. But they lacked the free fling of the Frenchman's chisel.

THE GERMAN FEELING EXPRESSED IN THE CHURCHES OF THE LOW COUNTRIES

The feeling for width that marked the German churches, particularly Cologne Cathedral, was shared in the Low Countries. Antwerp Cathedral, the finest church in Belgium, is very wide, with three aisles on each side the nave, which is carried high and has deep windows in the clerestory. A lofty fifteenth-century tower rises from the west end, and at the crossing of the transepts is a curious little turret, reminding one of Saracenic architecture, set up when Spain was the ruling power in Flanders.

Antwerp Cathedral was built in the Flamboyant period, and is covered with the profuse ornament of the last Gothic style. By accident or most wise design, the second western tower was never carried up more than one storey; otherwise the cathedral, like that of Cologne, would have been sadly dwarfed.

St. Gudule, Brussels, a much earlier church, has good western towers, in excellent proportion. There is very beautiful stained glass in the choir chapels. It is perhaps in Tournai Cathedral (1066-1338) that one sees most the passage of the architectural periods in the Low Countries, whose complicated and changing history and internal rivalries crushed out any

great creative spirit like that which has made France wonderful for ever. More genius went into the guild halls and town halls than into the sacred buildings of these Flemish cities, whose wealth was a byword in Europe.

THE CHARM OF SPIRES AND BELFRIES IN BELGIAN ARCHITECTURE

There is a distinct charm in Belgian architecture with its spires, belfries, towers, and ridged gables. Bruges Cathedral rises very finely over the peace pool of the town. The churches and cathedrals of Ypres, Ghent, and Dinant fit happily into their place and show the influence of changing periods. The cathedrals of Holland, Utrecht, Haarlem, Dordrecht, are simple, with very bare interiors, but their shapes are made attractive by the level water light flooding the walls and by the immense and tranquil skies of the Dutch landscapes.

In certain parts of Italy pure Gothic architecture never appeared. The Gothic spirit was part of the miracle of the Italian Renaissance, as we remember in our earlier chapters on painting and sculpture, but its expression was altered by existing forms and traditions. Rome, the stronghold of Classic art, closed her doors against this northern invader; there is only one Gothic church, St. Maria sopra Minerva, in the whole great area of the eternal city.

Elsewhere in Italy the resistance of Romanesque and Byzantine traditions were great. The high-flung vaults of northern France were not suffered to rise; there were few flying buttresses and pinnacles, roofs were kept flat, windows small. The main feature of French Gothic had been upward soaring lines; this the Italian architects counteracted by insisting on horizontal courses. The result is a most interesting group of buildings, but they can hardly be called Gothic, as the French understood it.

THE SPLENDID MARBLE PILE WITH THE DELICACY OF A PIECE OF LACE

The nearest in spirit to the buildings of the north, and the exception to several of the rules of Italian Gothic, is Milan Cathedral, and it is more German than French in plan. This great marble pile, which took a hundred years to build and absorbed the energies of half a hundred architects, is one of the most wonderful creations of a wonderful period.

It is the second largest cathedral set up in medieval times. But the merit of the

building is something not measurable by square feet; nor is it flawless in style and proportion. Its numberless pinnacles and points, surmounted by statues, seem as if they were stalagmites flung upward from a fairy grotto. The long, horizontal lines of the building are only broken by long, narrow windows and unobtrusive buttresses, the whole formation delicately sheathed in a web of vertical strands. Huge as a fortress, it seems delicate as a lace shawl.

Florence Cathedral, also called St. Maria del Fiore, is a building of a very different kind. It was erected in the Gothic period, from about the end of the thirteenth century to the middle of the fifteenth, but in spirit it is Italian Romanesque. It is a remarkable structure, in plan a long cross of an unusual type. The nave leads up to a great domed octagonal space, and from this three apses, each domed, break out, one in the eastern end in the usual way, and twin apses in place of transepts. Five chapels cluster round each apse.

THE FAMOUS ARCHITECTS WHO BUILT THE CATHEDRAL AT FLORENCE

To pass from the nave into this great area of radiating shapes is to receive an unforgettable impression of majesty and dignity. A quaint clerestory of circular lights is set high in the nave walls. The general effect of the exterior, with its coloured marble panels and small windows, is horizontal—long lines following each other round the entire building, and all leading on to receive the weight and insistence of the massive dome. The decorating of the west front was begun in the thirteenth century, and left untouched till late in the nineteenth.

Round this cathedral much ambition and pride and many lives have gathered. We know something of the immense pride of the Florentines in their city and their art from our earlier chapters, and the cathedral, with its campanile and the baptistery standing close by, is the large monument of their heroic spirit. Famous names run in and out of its story. The first architect was Arnolfini di Cambio. Sometime after his death Andrea Pisano and Francesco Talenti took up the work. The crowning labour, in more ways than one, was the huge dome set up by Brunelleschi when Renaissance architecture was developing in Italy.

The baptistery is a Romanesque building to which Arnolfini di Cambio made

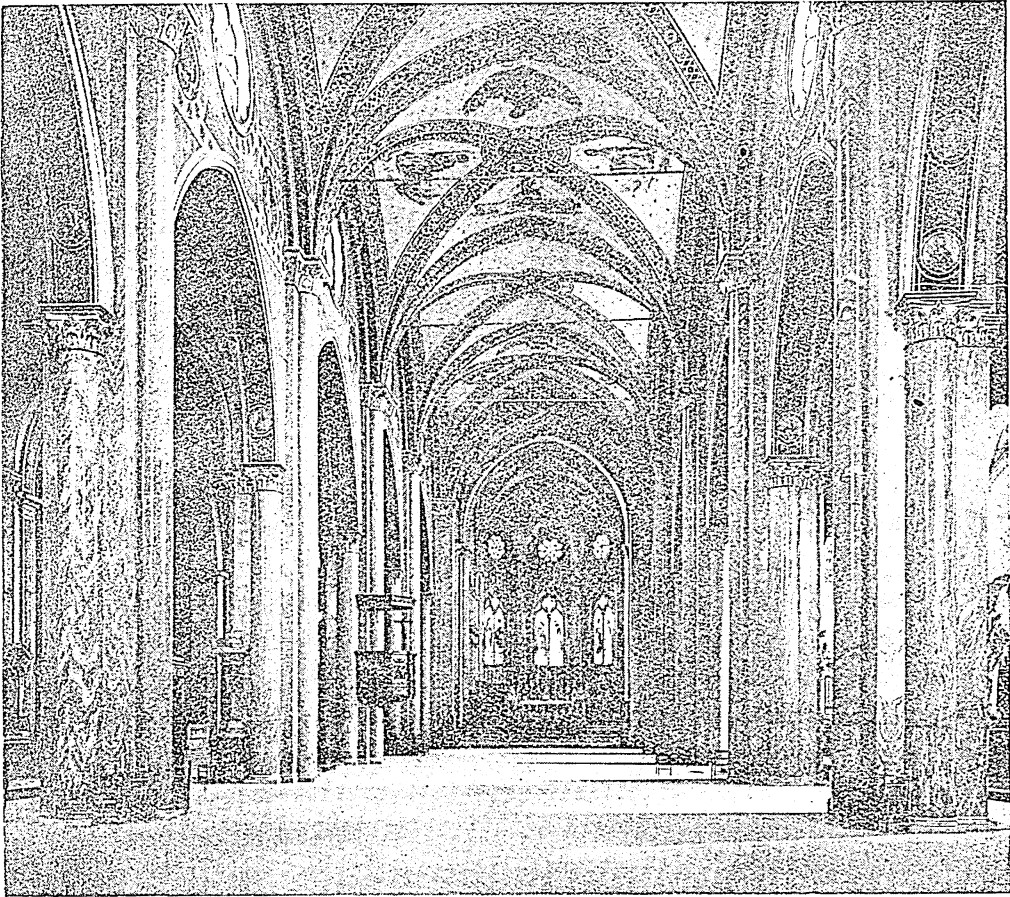
THE GOLDEN YEARS IN EUROPE

alterations in the late thirteenth century. It is octagonal in shape and faced outwardly with black and white marble. All over the world this building is famous because of its marvellous bronze doors, the work of Ghiberti and Andrea Pisano.

The campanile was designed by Giotto, a truly Italian erection of great beauty. As in the case of most Italian towers, like those at Siena, Mantua, Lucca, and Verona, the contour is unspoiled by buttress projections: the square walls rise cleanly

planned by Taddeo Gaddi. Or San Michele possesses some particularly lovely statuary by some of her famous sculptors, like Donatello and Ghiberti. In St. Croce are sculptured tombs to many notable persons.

When we think of Italian churches we think first and foremost of the historic St. Francesco at Assisi, set up in the middle of the thirteenth century. It is built on a hillside in two storeys. The style is simple; there are no aisles, and both the upper and lower church end in an angular



THE INTERIOR OF THE CHURCH OF SAINT MARIA SOPRA MINERVA IN ROME

from the ground. Its fine vertical mass is a lovely pattern of coloured marble panels and sculptured reliefs. This tower, contrasting with the horizontal lines of the cathedral, and balancing the heavy mass of the dome, finishes one of the finest groups of medieval architecture in Europe.

In addition to the cathedral, Florence possesses some very fine churches—St. Croce, planned by Arnolfini di Cambio, St. Maria Novella, whose architects were two Dominican monks, and Or San Michele

apse. It is not only a most interesting architectural work, but a monument to a man whose story is eternally bound up in the early years of the Italian Renaissance. We know from our chapters on painting of the frescoes that adorn the dim, vaulted interiors of the upper and lower church.

The cathedral at Siena, set up as a kind of stepped platform on the sloping ground, is a fine and imposing building marked, like most of the Italian Gothic cathedrals, with a dome over the wide space at the

crossing. All the artists of the town helped to set up and adorn this their chief church, and their pride in it was immense. It was planned on a huge, ambitious scale. The actual building took from 1245 to 1380, but the proposed second nave, a continuation of a transept, has never been finished. On floor and walls, outside and inside, the art of Siena has stamped her cathedral. One of its most renowned features is the pulpit carved by Niccola Pisano.

THE BEAUTY OF THE WORK OF GOTHIC YEARS IN ITALY

In the cathedrals of Orvieto and Palermo, and in churches like St. Antonio, Padua, St. Giovanni and St. Maria Gloriosa, Venice, St. Anastasia, Verona, and St. Petronio, Bologna, the art of Gothic years in Italy produced wonderful and memorable work. The farther south we go the more remote from pure Gothic is the style. Palermo Cathedral is built on the plan of the old basilican churches and reminds us more of Saracenic architecture than Gothic. In almost every Italian church there is sculpture and adornment by great artists. Some were built by monks out of love of God; some by citizens out of pride in their city. To go from the Alps down to Sicily and look at sacred buildings alone is to receive a liberal education in art.

We spoke just now of Milan Cathedral as the second largest in medieval Europe. The first in point of size is the cathedral of Seville, which, except for St. Peter's, Rome, is the largest church in the world; and this brings us into that strange and attractive world of Spanish art where the genius of the so-called Moors had left an ineradicable strain of beauty. Some of the most delightful work of Europe hides in odd corners of Spain; doorways which make one think, curiously, of some haunting song that is native to no one country or period, walls that strike a dreaming silence, as if the world had forgotten to pass that way.

THE INFLUENCE OF THE MOORS IN THE GOTHIC BUILDINGS OF SPAIN

In the north of the peninsula, naturally, in Catalonia, the influence of Gothic was most felt. But pure French Gothic is almost unknown. The architects threw up great vaulted buildings, and nestled little chapels between the buttresses, so that the walls seem flat outside. Horizontal rather than vertical lines mark the structures. Windows are not huge, as in the north of Europe; cloisters of great beauty, as at

Barcelona, Segovia, Toledo, and Lerida are ornamented in a style natural to the inheritors of Saracenic art. The style of the horseshoe arch, the endless geometric wall-decoration, and the open stonework of Moorish times passed on through the short Romanesque period—whereof few traces remain—and allied itself naturally with Gothic, making a different architecture from the rest of Europe.

Seville Cathedral was built in the fifteenth and early sixteenth centuries on the site of a Mohammedan mosque. Its great masses are grouped unfamiliarly, but the structure nevertheless achieves a distinction which hugeness alone is incapable of. Its lovely stained glass throws shafts of colour across the great aisles, each as wide as the nave of Westminster Abbey, and makes even richer the rare carvings and ornamentations. In a smaller place the adornments would be too heavy, but the cathedral adjusts its proportions very happily. Were the exterior as graceless as a barn it would still be saved by the Giralda, one of the loveliest towers in the world, of which we have already spoken.

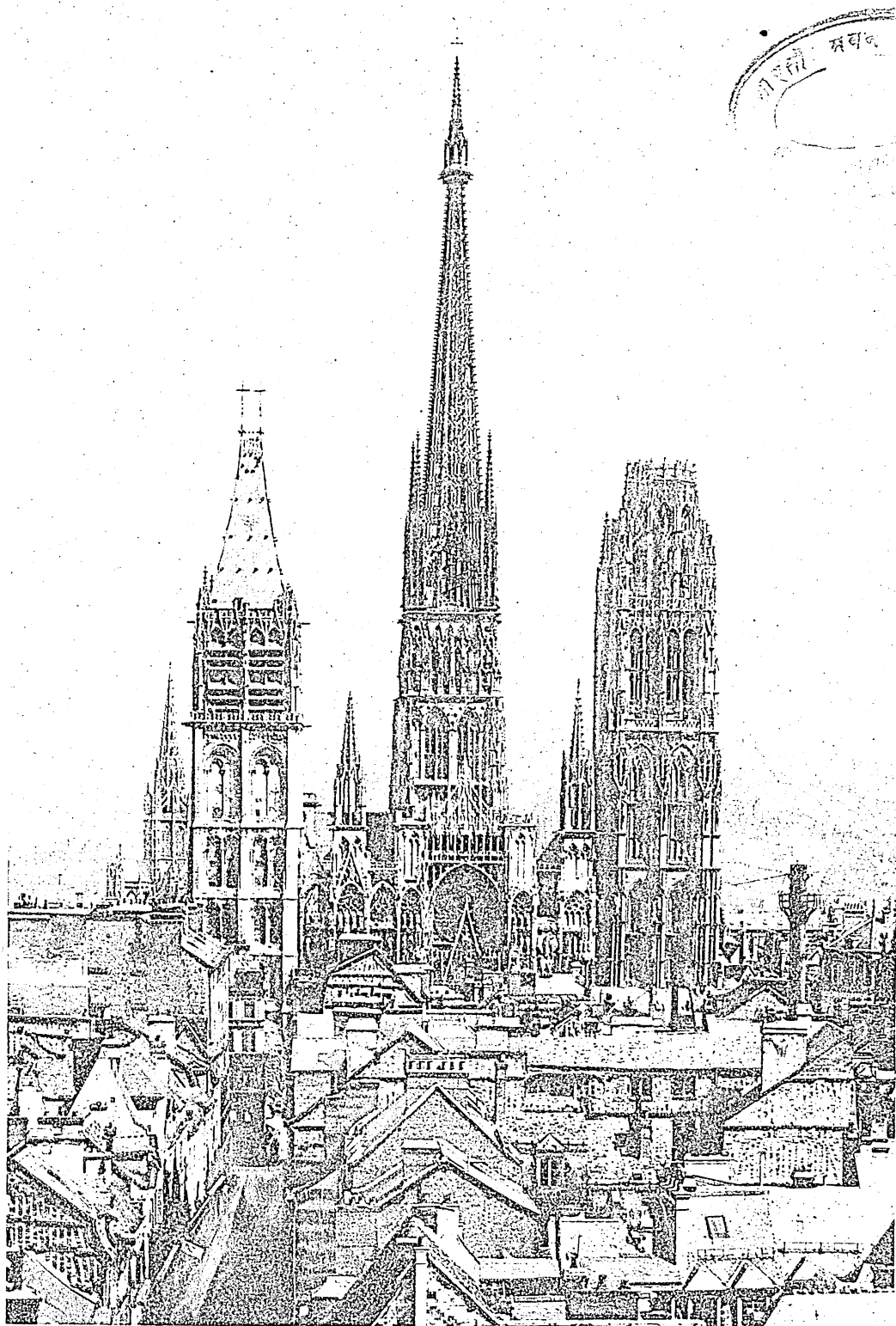
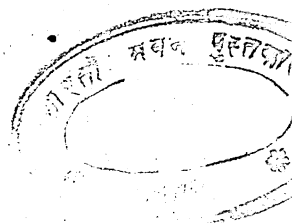
THE VARIETY OF STYLES SEEN IN THE BUILDINGS OF SPAIN

All the medieval cathedrals and churches of Spain are intensely interesting. One feels continually that history no less than the architect has been planning and shaping here. Of no one building could it be said that it is purely such and such a style. The cathedrals of Valencia and Leon, set up in the thirteenth century, remind one suddenly of France; Barcelona is a little Italian in shape. Toledo, Avila, and Gerona are, like the rest, marked by rich interior carvings.

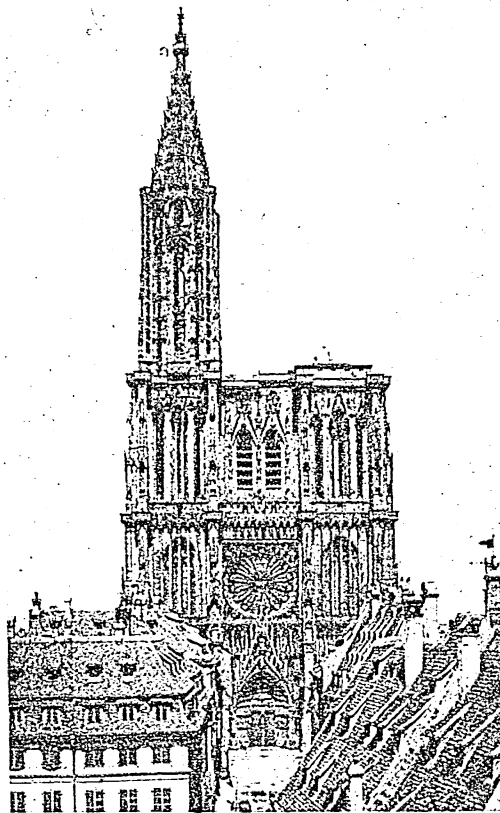
Burgos is perhaps the most romantic and Spanish of all the cathedrals in the peninsula. One of the loveliest doorways in Europe is that of St. Pablo, Valladolid. It might be classed as Gothic, but the long dead Saracens guided the builders' hands.

Spain was too conservative, for all her upheavals, to allow herself the fine, undivided enthusiasm of early France. As we think of her sacred buildings we wish perhaps that she had expressed herself singly and loudly in some one great way, comparable with pure Gothic architecture. Then when we look at her work again and see here the Saracen, here the Romanesque, here the Gothic, and everywhere the sense of Spanish art, we would not have her story changed.

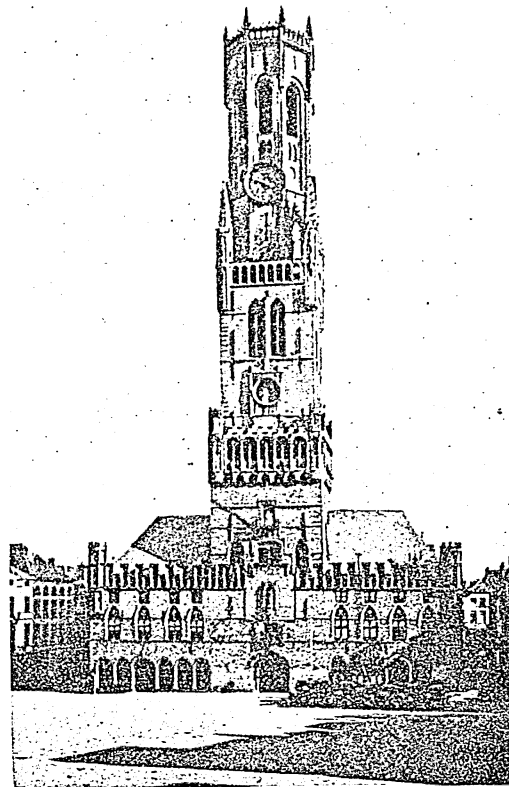
BUILDINGS OF EUROPE'S GOLDEN AGE



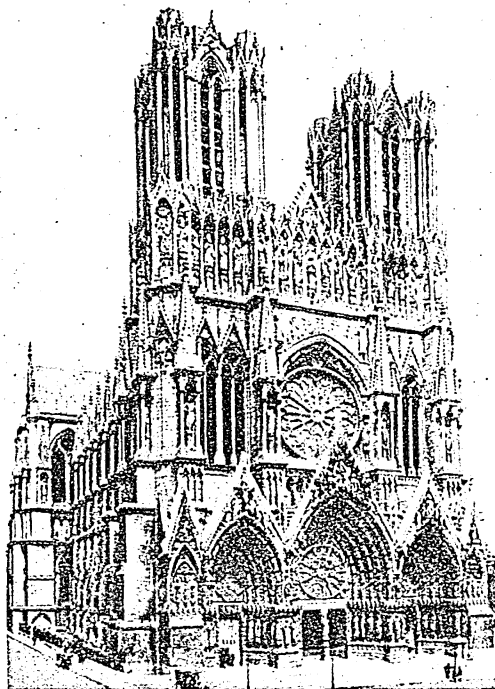
THE WEST FRONT OF THE BEAUTIFUL CATHEDRAL AT ROUEN



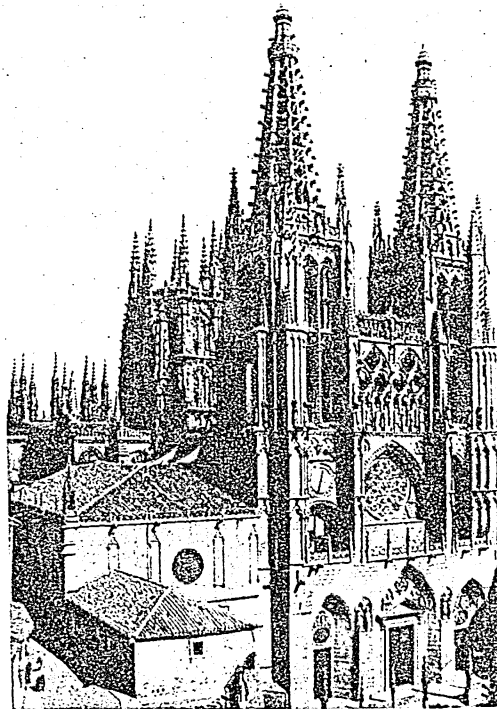
WEST FRONT OF STRASBOURG CATHEDRAL



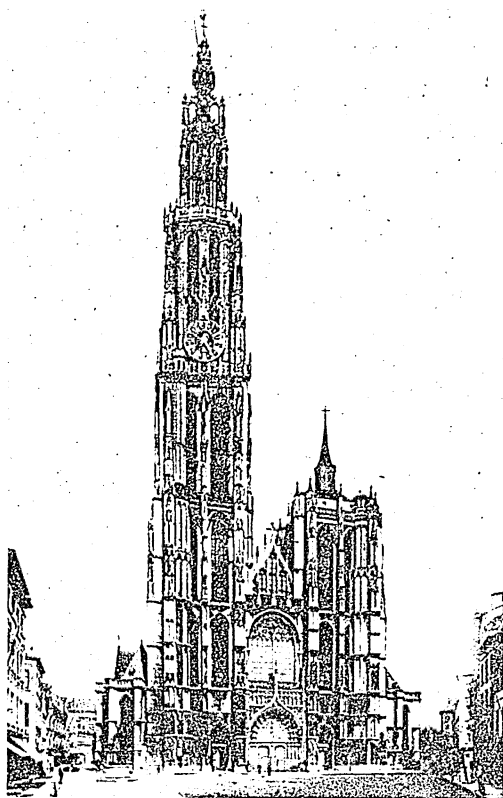
THE HALLES WITH THE FAMOUS BELFRY AT BRUGES



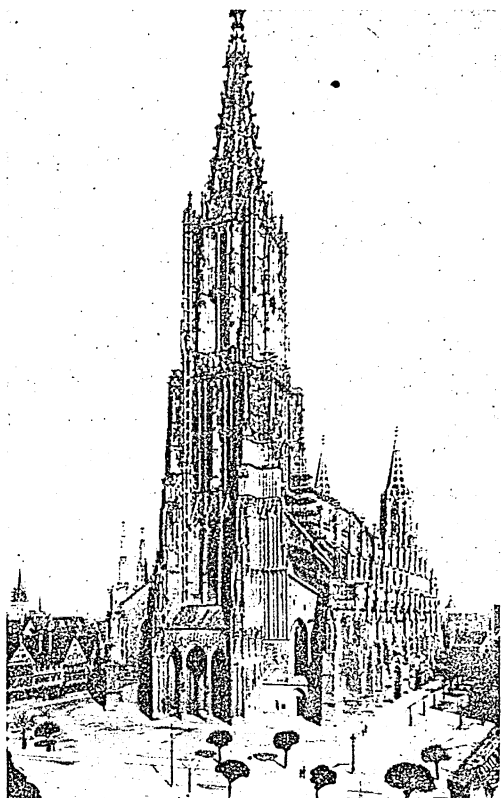
RHEIMS CATHEDRAL BEFORE THE WAR



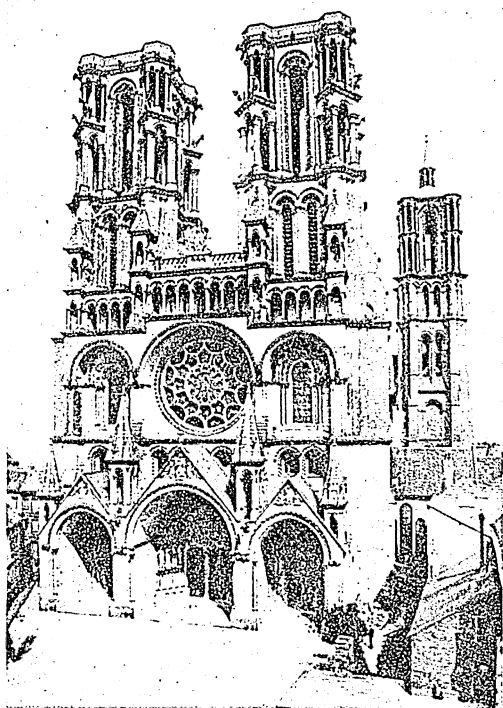
BURGOS CATHEDRAL IN SPAIN



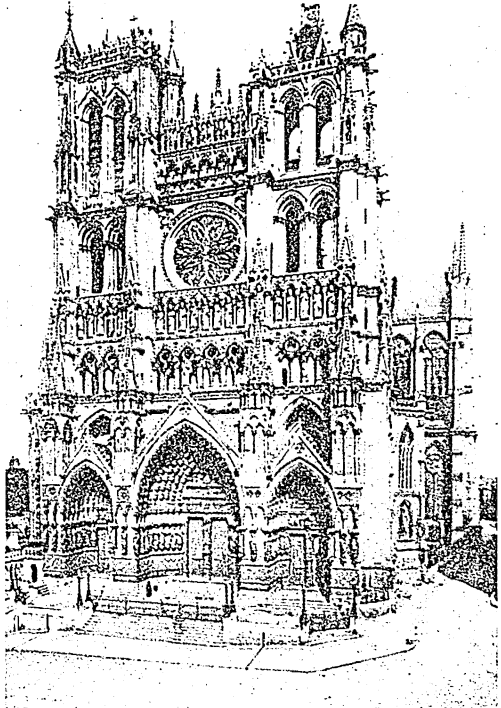
THE CATHEDRAL OF NOTRE DAME IN ANTWERP



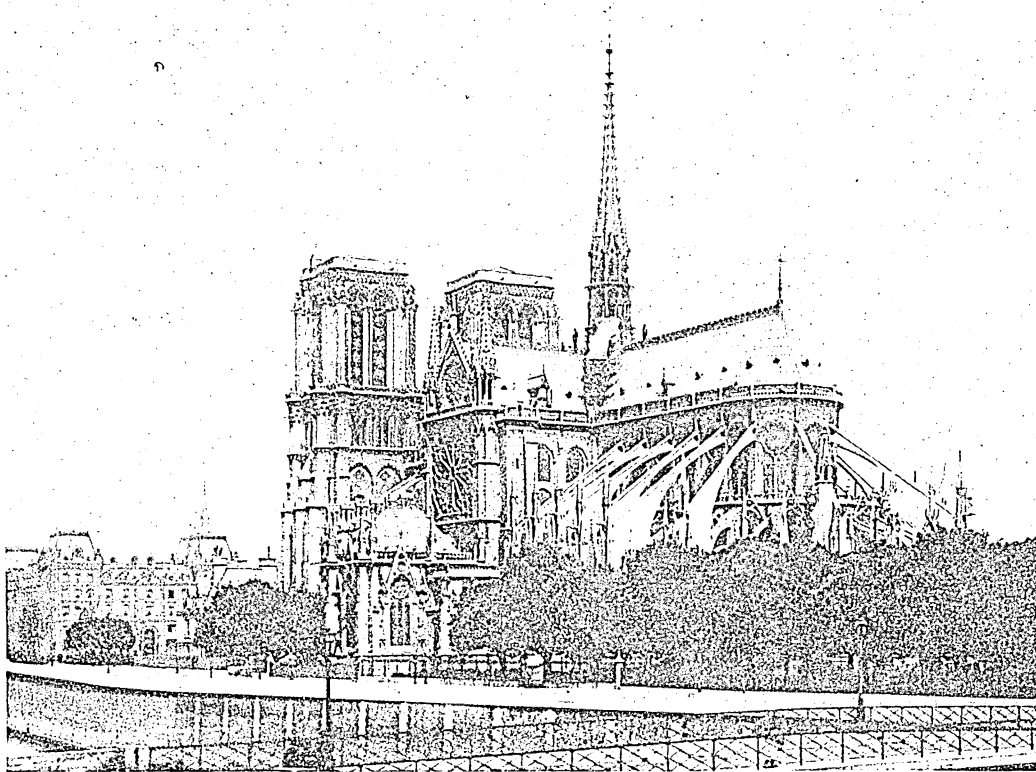
ULM CATHEDRAL IN GERMANY



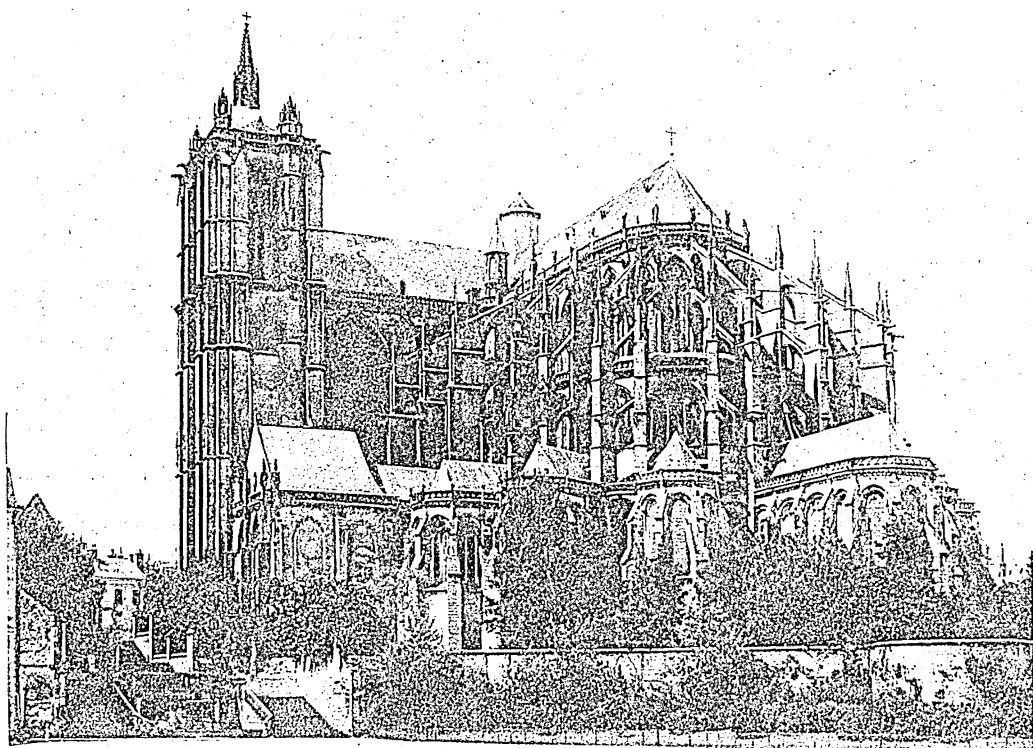
NOTRE DAME AT LAON



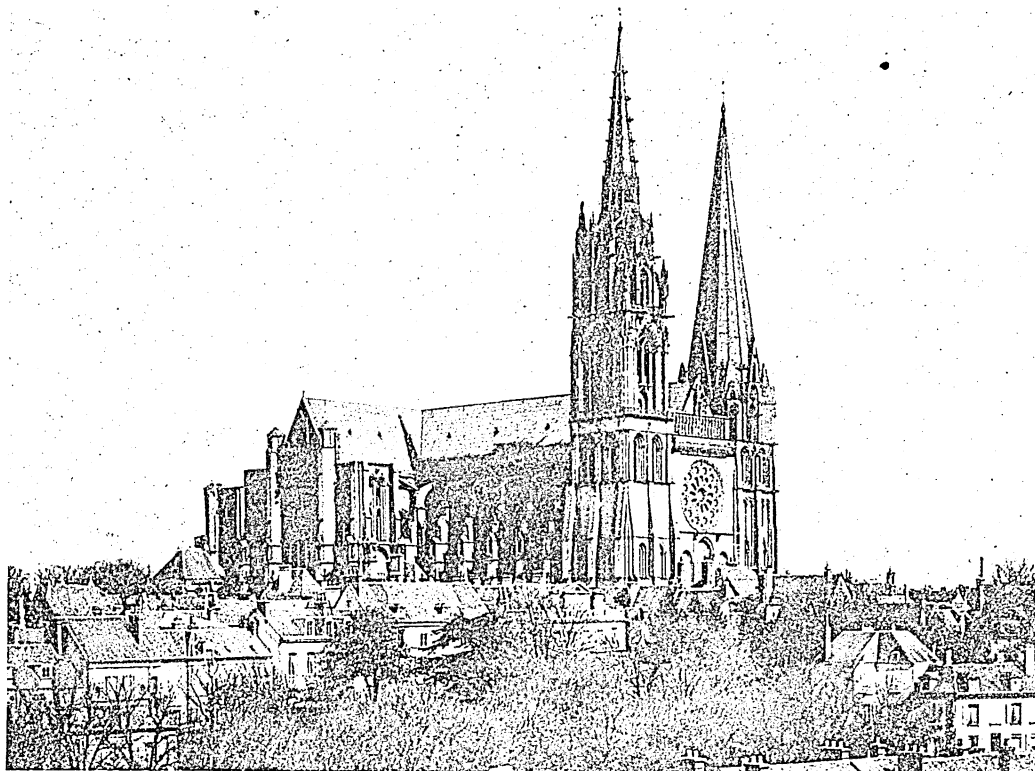
AMIENS CATHEDRAL



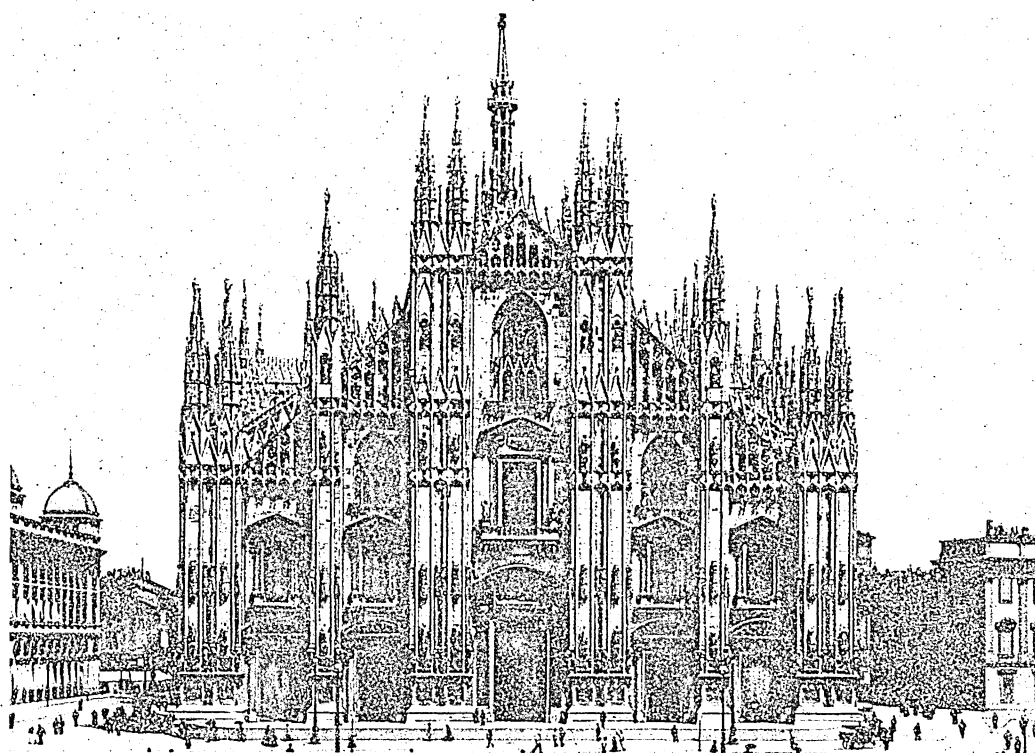
THE BEAUTIFUL CATHEDRAL OF NOTRE DAME IN PARIS. SHOWING THE APSE



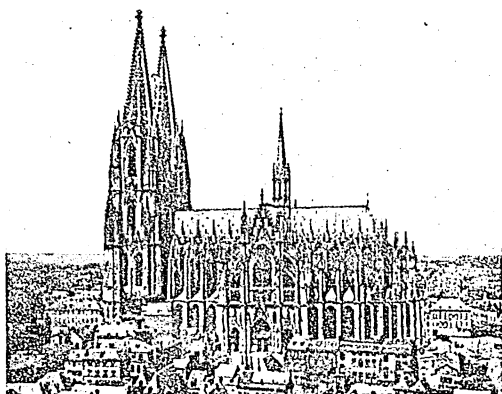
THE APSE OF THE CATHEDRAL OF ST. JULIEN AT LE MANS



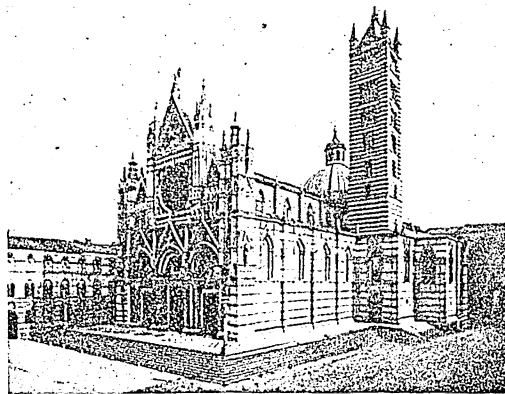
THE NORTH SIDE AND WEST FRONT OF CHARTRES CATHEDRAL



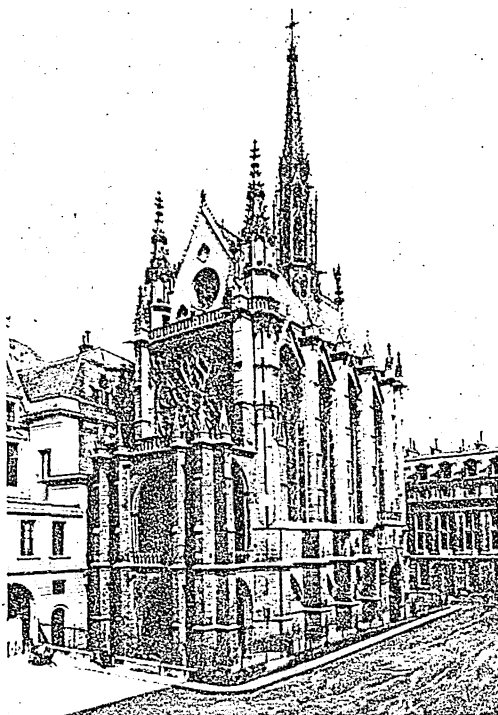
THE FRONT OF THE WONDERFUL CATHEDRAL OF MILAN



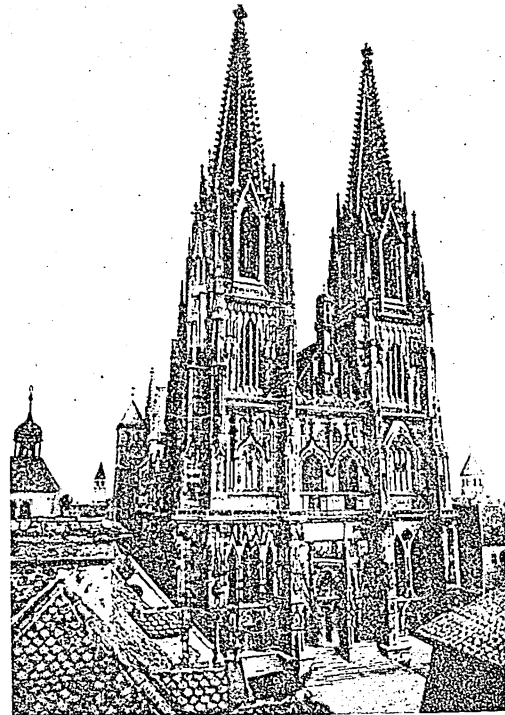
COLOGNE CATHEDRAL



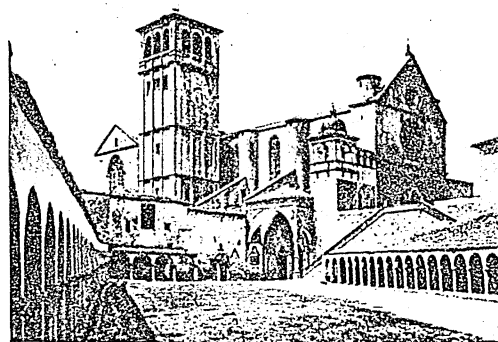
SIENA CATHEDRAL



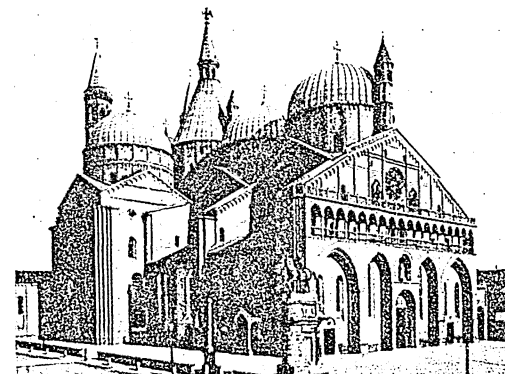
THE SAINTE CHAPELLE IN PARIS



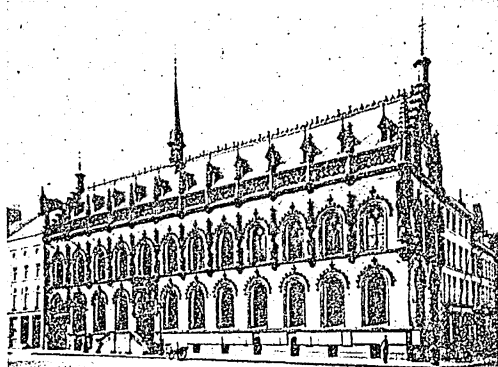
RATISBON CATHEDRAL IN GERMANY



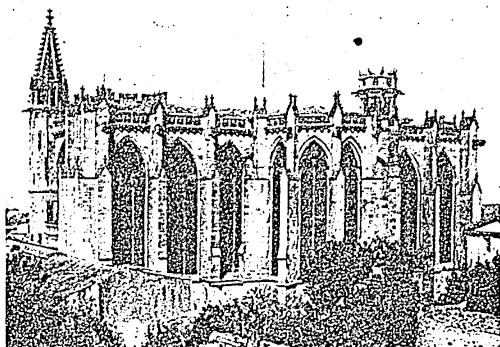
THE CHURCH OF ST. FRANCESCO AT ASSISI



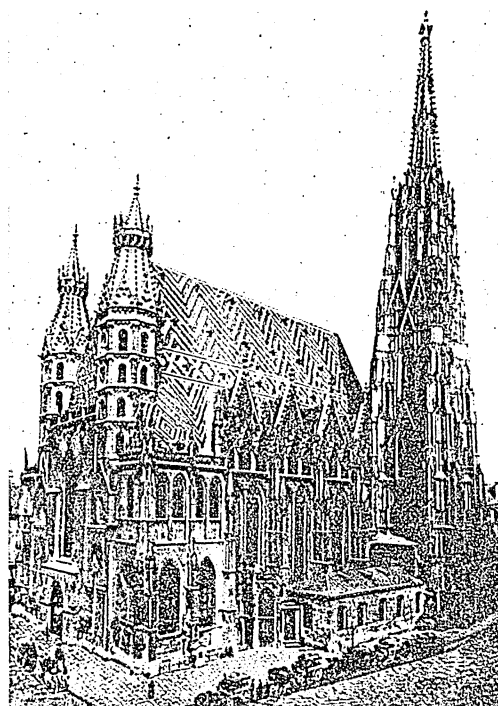
THE CHURCH OF ST. ANTONIO AT PADUA



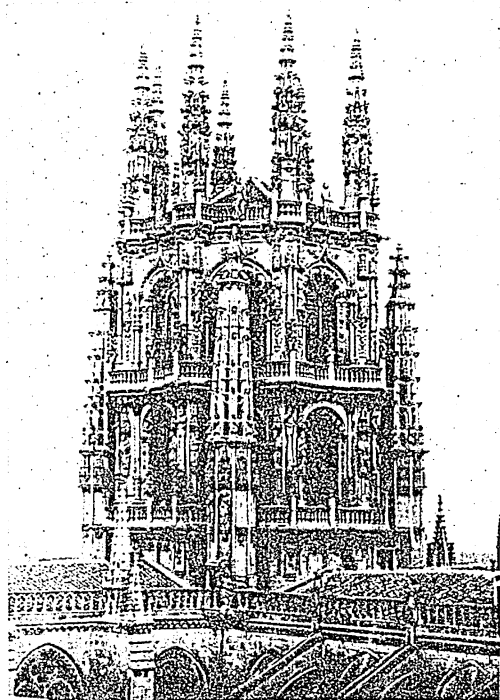
THE HÔTEL DE VILLE AT COURTRAI



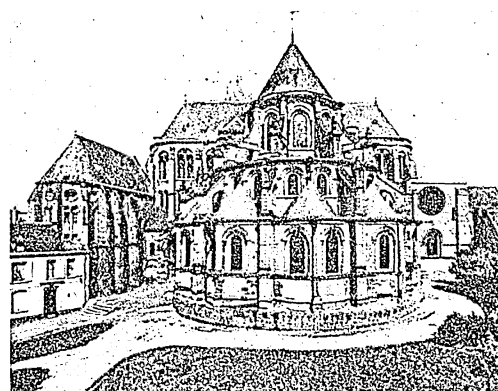
THE OLD CATHEDRAL AT CARCASSONNE



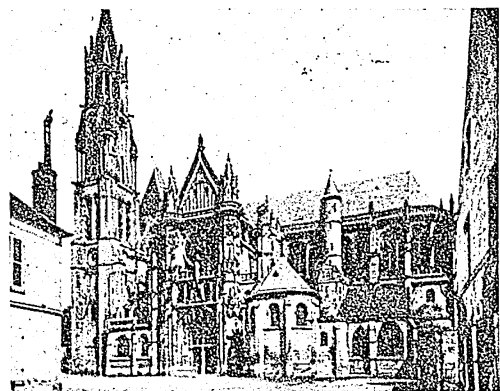
ST. STEPHEN'S CATHEDRAL IN VIENNA



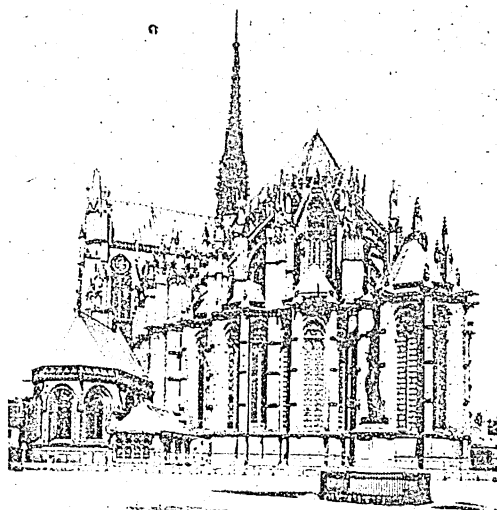
BURGOS CATHEDRAL. SHOWING THE LANTERN



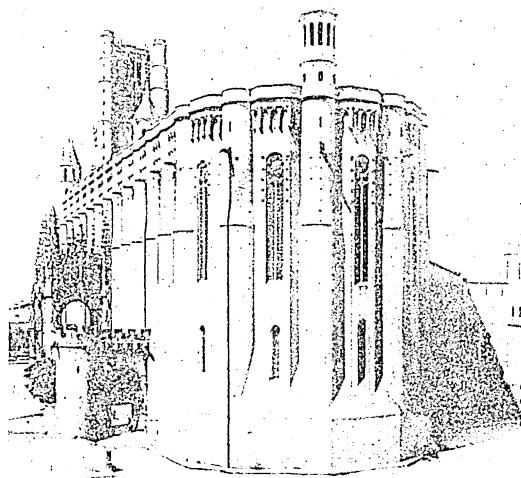
NOYON CATHEDRAL BEFORE THE WAR



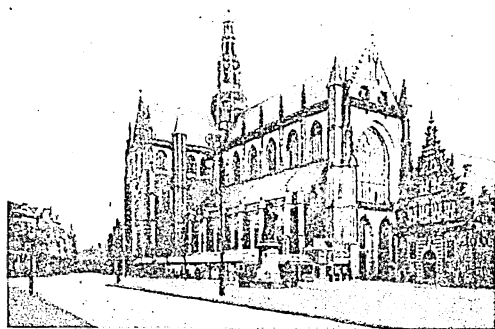
SENLIS CATHEDRAL IN FRANCE



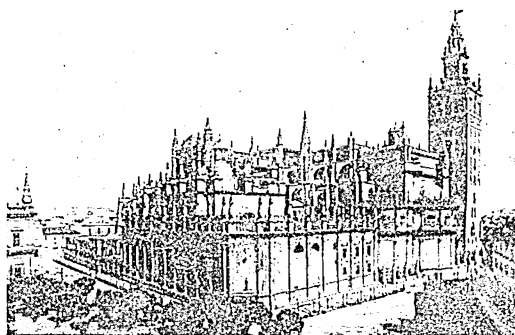
THE APSE OF AMIENS CATHEDRAL



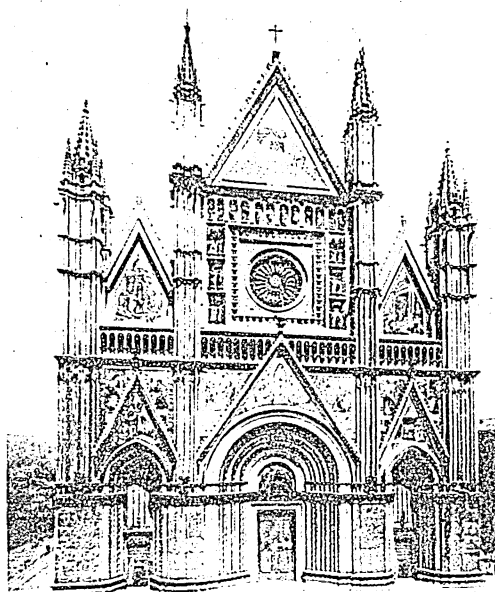
ALBI CATHEDRAL IN FRANCE



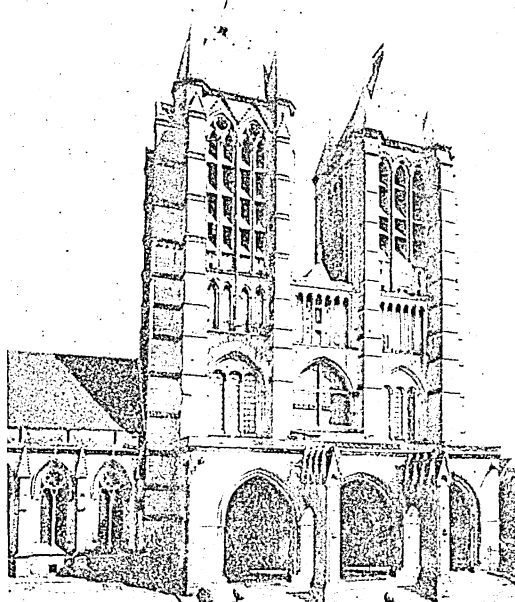
THE GREAT CHURCH AT HAARLEM IN HOLLAND



THE CATHEDRAL AT SEVILLE



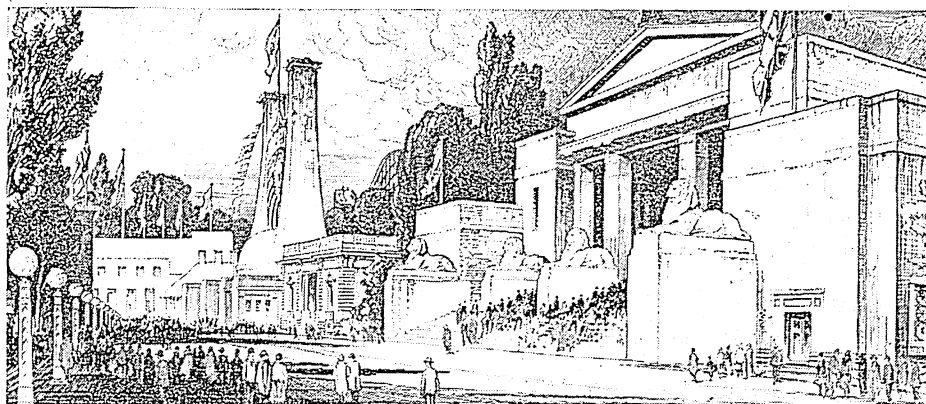
ORVIETO CATHEDRAL IN ITALY



NOYON CATHEDRAL BEFORE THE WAR

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The Wonderful House We Live In, and Our Place in the World



The British Government building at Wembley, a symbol of the wealth of the nation—Reproduced from The Times

THE WEALTH OF THE EMPIRE

IF we look at a map of the world we see that the greater part of our globe is covered by water. The next thing we notice is that most of the land is in the northern hemisphere. If the British Dominions are coloured red, we see that there is red everywhere—in Europe, in Asia, in Africa, and in America, while the only great pieces of land in the southern seas, Australia and New Zealand, are entirely red.

What a contrast it is, that between the area of the United Kingdom, in its place at the Atlantic Gate of Europe, and its widespread Dominions overseas! In the home country some 48 millions of people live on an area of only 120,000 square miles, or 400 persons to each square mile; while save for a few mountains, heaths, woodlands, and deer forests, every square yard has been worked over, cultivated, mined, drained, or built upon.

But our little country is the head of a great Empire which covers one-fifth of the land surface of the entire world, and is peopled by about one-fourth of the world's inhabitants.

There may be about 1800 million people in the world, and of these about 450 millions inhabit the British Empire. In the Self-Governing Dominions there

are about 23 millions, of whom 9,100,000 are in Canada and Newfoundland; 5,600,000 in Australia; 1,300,000 in New Zealand; and 7,000,000 in the Union of South Africa.

In the other parts of the Empire overseas there are about 380,000,000, of whom about 320 million people are in India.

But the white men in the British Empire form a small proportion of the whole. There are about 18 million white men, women, and children in the Empire outside these islands. Adding the 48 millions in the homeland, we get a total of 66 millions, so that of the Empire's inhabitants about one in seven is a white man.

There is no more remarkable thing in the world than the fact that one-fifth of its area inhabited by one-fourth of its people is governed by a comparative handful of Europeans. In the time to come, no doubt, Canada, Australia, New Zealand, and South Africa will become the home of hundreds of millions.

While most British white people are here at home, the greater part of the Empire's resources is over the sea. Where the Empire has least natural wealth—in the United Kingdom—it has most of its white people. Where the Empire has most of its natural wealth—in Canada, Australia,

OURSELVES

and South Africa—it has least of its people. The wealth of the Empire cannot be properly developed until there is a better adjustment of the population.

The little British Isles are rich in iron, but poor in all other metals. We produce copper, zinc, lead, tin, gold, and silver in small or negligible quantities. Copper and zinc are among the most valuable of the metals, and together they make that splendid alloy, brass, which is used for so many different purposes, and the manufacture of which employs so many people. Of copper ore we produce only about 500 tons, and of zinc only about 4000 tons. Greater Britain, as the Dominions overseas are sometimes called, produces very large quantities of these metals, and it is also rich, as we are poor, in lead and tin. Greater Britain also produces about one-half of the world's gold and about one-fifth of the world's silver.

With regard to coal and iron, Greater Britain does not appear to have the exceptional resources of the United States and China; nevertheless, it has a great and increasing production of both of these valuable products.

THE COLOSSAL POWER OF THE RIVERS NOW WAITING TO BE DEVELOPED

The value of coal, as we have seen elsewhere in these pages, lies in the fact that with it we produce steam or electricity to drive engines. Another way to produce mechanical power is to utilise waterfalls. In the United Kingdom we have very poor water-power resources, but in Greater Britain, especially in Canada, New Zealand, and South Africa, there is enormous water-power to develop. For example, on the great River Zambesi, in South Africa, the Victoria Falls are 5000 feet wide and 400 feet high. This means that the Victoria Falls can supply energy for an enormous industrial area stretching for hundreds of miles all round the Zambesi, and there is no doubt whatever that some day this area will be one of the finest workshops of the world. The Canadian water-power resources are not less remarkable. In New Zealand there is enough water-power to carry on all the manufacturing needed by scores of millions of people, or many times the population of the whole of Australia and New Zealand.

There is no doubt, therefore, that Australasia, like South Africa and Canada, will become rich industrial regions as well as great food producers. This means that

they will become the home of hundreds of millions of white people, working happily and prosperously under better conditions than we in the home country have ever known. The children born in New Zealand two hundred years hence will look back on a proud record of development, and be the inheritors of wealth and comfort such as few people in Europe know today.

THE FOOD THAT COMES INTO THE MOTHER COUNTRY FROM ABROAD

Food producing is the first essential of the Empire's existence, and here again we see how much the Mother Country differs from its Dominions.

At home, so far as our daily bread is concerned, which is made entirely from wheat, we grow only about one-fifth of what we need. The remaining four-fifths have to be shipped from over the seas. Then again many valuable foods, such as rice, tapioca, tea, coffee, cocoa, bananas, oranges, and so on, Nature does not allow us to produce at all. Sugar, which possibly we might produce in some quantity, we do not cultivate, and we import enormous quantities of both sugar-cane and sugar-beet sugar. Of the meat we eat we produce about one-half, and we produce nearly all the milk, potatoes, and green vegetables we need. Butter and cheese we import in big quantities.

Of the foods we can grow, we produce, taking them all together, about one-half of what we need. To put it in another way, of our 48 million people we feed only 24 millions with home-grown food, while nearly 40 millions of our people would be without bread but for imported wheat.

THE GREAT PRODUCTION OF FOOD IN BRITAIN OVERSEAS

How very different is the position in the Empire outside these islands! As a whole it produces far more food than its people require, just as it produces far more raw materials than its factories require. While the British Isles import food, Greater Britain exports food. Of many important foods Greater Britain produces ten to fifteen times as much as the British Isles.

But the British Empire is capable of much more expansion in food production, and, indeed, it is difficult to exaggerate the possibilities in this connection, so the Dominions can not only continue to export food to the Mother Country, but can sustain much larger populations.

THE WEALTH OF THE EMPIRE

As with foods and metals, so with raw materials in general.

A very large part of the British Empire's area is suitable for the growing of the cotton plant. In Australia, in Africa, and elsewhere in the British Dominions a cotton production can be aimed at fully as great as has been realised in the United States, which now contains the world's greatest cotton fields. The cotton plant was not native in the southern States of America; the fine growth there was the result of introduction to a suitable soil and climate. Similar success can be undoubtedly achieved in many parts of the Empire. In the time to come, the world as a whole will need many times the amount of cotton which it now gets from America. Therefore, we must do all we can to develop the Imperial supply.

Then there is wool. We have a good many sheep here in Britain, but all their wool would not keep 48 million British people warm in the winter time. We have to get millions of pounds of wool from abroad to clothe ourselves, and also to make woollen and worsted yarns and cloths for the export trade.

THE AUSTRALASIAN SHEEP THAT HELP TO CLOTHE THE WORLD

Fortunately, Greater Britain is as rich in wool as the British Isles are poor. Australia and New Zealand are so rich in sheep that they are among the chief wool producers in the world. These countries are also among the chief exporters of mutton and lamb.

Another important textile material is jute, and in India we have the great jute supplier of the world. In other materials, hides, skins, asbestos, and so on, the British Empire is as naturally rich as the British Isles are naturally poor.

Here at home, looking out on the Atlantic, we still possess the greatest commerce and shipping in the world. The Britains beyond the seas, across the Atlantic in America, eastwards in Asia, to the south in Africa, and far away in the Southern Seas in Australia, possessing possibilities of industrial and commercial development such as we can never hope to possess at home, are advancing to a wonderful new prosperity.

The great Dominion of Canada is reclaiming the wilds from the Atlantic to the Pacific, and building what will in time become one of the most powerful nations

of the world. Her nine million people will become fifty millions and a hundred millions, easily sustained by her splendid prairies, forests, fisheries, mines, and water-power.

She sends to market wheat and meat, fish and fruit, butter and cheese, hides and skins, timber and minerals.

In the still mysterious East, the Indian peoples remain for the greater part engaged in agriculture, and a large proportion of them are still very poor. Nevertheless, the Indian territory possesses real possibilities of industrial development, and the Indian peoples possess wonderful skill and aptitude in the arts. India exports corn, tea, and spices, cotton, and silk, hides, jute, and hemp.

WHAT SOUTH AFRICA SENDS TO THE MOTHER COUNTRY

Turning to the south, we see the Union of South Africa growing in strength, with the old blood-feuds largely forgotten, and with a population of seven million white and coloured men, where some day there will be twenty or fifty millions. The chief South African exports, so far, are wool, copper, gold, and diamonds, but she will come to have more varied industries, and her power resources insure her a great industrial future.

Far away at the Antipodes, where our Great Bear is replaced as a familiar object in the heavens by the beautiful Southern Cross, lie those great territories, the Commonwealth of Australia and the Dominion of New Zealand. Rich these are in all men need to build up prosperity and comfort. There are splendid fertile areas, good coal, and much water-power. Australia, it is true, has a large desert area, but vast schemes of irrigation and ambitious railways are reclaiming ever more of the land of the island continent for human maintenance. Australia loads her argosies with wheat, mutton, beef, butter, cheese, fruit, and jam, wool, hides, skins, leather, copper, lead, tin, zinc, gold, and silver.

ONE QUARTER OF THE WORLD'S PEOPLE AT PEACE WITH ONE ANOTHER

New Zealand, it is true, has a small population, hardly bigger than that of Glasgow; nevertheless she already supplies the world with great quantities of food, wool, hides, and so on, and the day is not far distant when ten million New Zealanders will enjoy a great prosperity in

one of the most beautiful lands of the Earth. The glorious thing about all these developments within the Empire is that between these small nations growing into big ones the possibility of serious differences arising does not exist. *One-fourth of the world's people, at least, are at peace with each other.* The growth of the British Daughter nations is thus seen to be one of the biggest factors making for the peace of the world. It is all for good that we can see in the free Constitution of the British Empire how States, great and small, may keep their own special pride and responsibility in being, while joining with each other in common respect, in mutual aid, and in common pride of unity. The British Empire is really a Commonwealth of Nations, some of which are entirely self-governing, and others advancing to self-government with all that it involves.

**THE TRAFFIC WHICH IS FOR EVER
SAILING ACROSS THE SEAS**

There is everything to hope for in such a development and in such a splendid example. Peace between hundreds of millions of people, constituting a host of different races and States, is seen to be not only a thing to hope for, but a thing which can be actually accomplished with a good will on all sides.

And this matter of which we speak is closely concerned with the state of society and conditions of life in the Mother Country. Again and again we have to remind ourselves of how we live in this little country—by virtue of the trade done in the tall ships which ply increasingly across the narrow and the deep seas. Amazing it is to think of the big vessels steaming out with coal, and goods of all sorts made in our factories, in their holds, and coming back to us laden with gold and ivory, meat and precious stones, hides and ostrich feathers, wool and Turkey carpets—with every good thing man has ever made, grown, or unearthed in any corner of the world, however distant, however difficult to reach.

**THE TERRIBLE CONDITIONS OF LIFE
THAT ALWAYS FOLLOW WAR**

Will this process of shipping out and shipping in continue? Shall we be always able to find customers abroad to buy our manufactured wares, so that we may get in exchange what we require?

The growth and development of the British Empire will have much to say in

answer to these questions. At the end of the greatest war of history Britain finds herself impoverished, and facing a host of doubts and fears. Let us remember, then, that it was the same a century since. After the long contest with Napoleon which ended at Waterloo in 1815 the nation found itself poor and troubled by the necessity to trade in a world which had been dislocated and impoverished. Things were so bad then that in 1816 the Common Council of the City of London declared that commerce, industry, and agriculture were equally sinking through ruinous wars, subsidies to allies, a delusive paper currency, and a long course of lavish and improvident expenditure of public money.

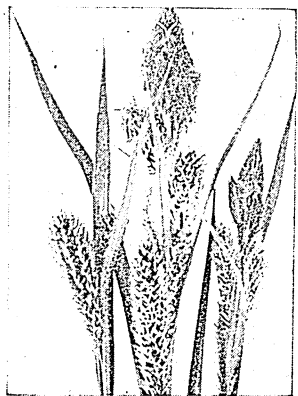
How much this sounds like an utterance of our own time! Yet the troubles of 1816 faded, and in a world which presented much less opportunity than that of today. At the beginning of the nineteenth century England, Wales, Scotland, and Ireland had only some 16 millions of people, and the great new countries which now flourish beyond the seas were in their infancy. The markets of North America, of South America, of Australia, and New Zealand, either existed not at all, or were so small as to be negligible. Yet exports grew, and after the adoption of the liberal trade policy in the eighteenth-forties grew apace.

**WHY WE SHOULD ALL REJOICE IN
THE PROSPERITY OF OTHERS**

The markets of the British Empire, it is not too much to say, are worth more today to the British trader than the markets of all the world were worth after Waterloo. It is true that in the last hundred years other countries besides Britain have become manufacturers and big traders, and the competition between sellers will be bigger and ever bigger as time goes on. Against this we can put the confident hope that the world will need to buy very much more than in the past, and that the Britains beyond the seas will offer increasing opportunities.

All that we have stated about the future prospects of the British Dominions makes for the advantage of the Mother Country. It is a case of mutual advantage. A nation like ourselves which must either trade with places overseas or disperse most of its people to seek a livelihood elsewhere, has cause to rejoice in the prosperity of overseas customers, and not least in the progress of the Daughter States of the Empire.

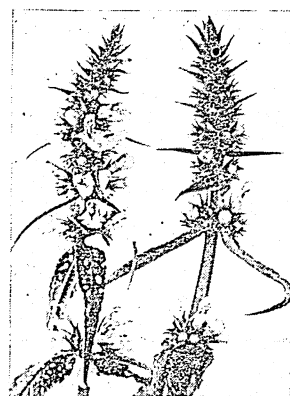
The Story of the Marvellous Plants that Cover the Earth



Marsh Sedge



White Water-Lily



Marsh Woundwort

FLOWERS OF THE STREAM

WE cannot walk much by the side of a river or a stream without becoming conscious of the fact that the plants of inland waters are of two main kinds. Those growing by the margins of streams are generally tall, and have narrow leaves. They grow in great numbers and their narrow leaves enable them, like the grasses, to thrive by catching the sunlight. They do not need broad leaves to collect moisture, as they receive all they require by means of their roots.

On the other hand, plants actually growing in the water, floating or spreading their leaves on the surface, have broad leaves, rounded or lobed, and their upper sides are covered with wax, so that water does not settle on them, but rolls off. The reason for this is that their upper surfaces bear stomata, or air-mouths, and it would be bad for the plants if these were to be clogged with water. The floating leaves have the same structure as ordinary land-plants, but the submerged leaves are usually long and strap-shaped, and bear no air-mouths, as they do not need them. These under-water leaves get their salts, oxygen, and carbon dioxide directly from the water, and not from the air, the water containing the salts and gases passing into the leaves and being assimilated by the plant.

A submerged plant obtains its food easily and therefore grows and spreads rapidly. In tropical regions rivers become blocked, for the water plants grow continuously all the year round. While in temperate regions the winter acts as a brake on plant growth, nevertheless, in spring, summer, and autumn, when conditions are genial, they multiply with very great rapidity.

Perhaps the most characteristic and beautiful flowers of the stream are the yellow and white water-lilies. The yellow is, perhaps, the more showy, although it remains more or less ball-shaped, its five or six large yellow sepals enclosing about twenty small and narrow petals. Some leaves are submerged and are narrow, but those that float are heart-shaped, thick, and leathery. The plant has a thick, fleshy rootstock, which contains much tannic acid and is sometimes soaked in milk to be used as a lure to cockroaches. The Turks prepare a cooling drink from the flowers. These smell much like brandy, hence the name of "brandy bottle," often used in the country for the plant. The fruit, which ripens above the water, is in the shape of a flask, and the seeds lie buried in the pulp.

If less showy, the white water-lily is more beautiful. It belongs to a different

species, and its flowers spread widely when fully open. The leaves, from five to ten inches across, are all floating, and the plant is frequently found on large sheets of water. While in the middle of the day the flowers rise above the water and expand, towards evening they close up and sink.

Though called lilies, they are not lilies at all, but belong to a family which goes by the somewhat difficult name of Nymphaeaceae, so-called because they are found growing in the places the nymphs were supposed to haunt. A real lily of the stream is the snake's head, or fritillary, a beautiful plant a foot high, with a drooping flower shaped like a tulip and curiously chequered with pink and dull red or purple. This marking, and the shape of the unexpanded blossom, have given the plant its popular name of snake's head, and the other name is from the Latin fritillus, a dice-box; not that the plant is like a dice-box, but the pattern of its flowers is like that of the chequered board on which dice were formerly thrown.

The snake's head has a small bulb, and long, narrow leaves on its rounded stem, much like those of the bluebell, but not quite so wide. The plant is about a foot high.

THE HANDSOME CORN FLAG WHOSE SEEDS ARE USED IN PLACE OF COFFEE

Another plant that grows abundantly along the banks of rivers and streams is the corn flag or yellow iris, a stout plant with large, handsome yellow flowers, bigger than those of the fetid iris, or gladdon. The yellow iris has a creeping rootstock that is very acrid and yields a good black dye. In some parts of the country and in Russia, where the plant grows freely, the seeds are said to be roasted as a substitute for coffee.

The arrowhead is easily distinguished from all other plants of the stream by its distinctive arrow-shaped leaves. It is a member of the water-plantain family and is often found in rivers and ditches. A tall, leafless flowering stem rises from the midst of the arrowhead leaf-stalks, and at regular intervals this sends off short branches in threes, each branch ending in a large, delicate white or pink flower. The lower flowers, smaller than those above, have no stamens, while those above have many stamens but no pistils. The flowers with pistils develop into large round fruits. From the swollen base of the plant, runners are sent out in all

directions, and at the ends of these, before the winter sets in, tubers form, and next year each tuber forms a separate plant. The tuberous roots contain much farinaceous matter, and may be eaten either raw or boiled. They grow immediately beneath the surface of the mud, and seldom exceed the size of a walnut.

THE FLOWERING RUSH WITH NARROW LEAVES LIKE SWORDS

Belonging to the same family is the water-plantain itself, which is no relation of the plantain of the fields. It is a stout herbaceous plant, growing two or three feet high along the margins of rivers, lakes, and ponds, and is quite common in England. The white, pink, or pale lilac flowers resemble those of the arrowhead, but are smaller, and they soon fall off after ripening.

The flowering rush is another member of the same family, its only likeness to the true rushes being in its leaves, which are long and narrow, and its leafless flower stem. This stem, rising from two to four feet high, bears a large umbel of handsome, rose-coloured flowers. The plant has a thick, creeping rootstock. It is sometimes called the common butome, from its scientific name *butomus*—a term made up of two Greek words: *bous*, an ox, and *temno*, I cut—which reminds us that cattle were once supposed to cut their mouths with the sword-shaped leaves.

The rose family is represented by two plants, the meadowsweet and the water avens. The first of these is abundant and its foam-like masses of small white flowers are anything but rose-like in appearance. When examined separately, however, these flowers will be seen to be much like those of the blackthorn, or sloe.

THE FRAGRANT FLOWERS OF THE QUEEN OF THE MEADOWS

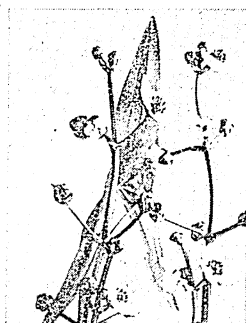
The flowers are very fragrant and the popular title, queen of the meadows, often given to the plant, is not undeserved. It grows three or four feet high, and the astringent roots have been used in the tanning of leather. In Iceland a durable black dye is obtained from a decoction of the whole plant, and formerly in England the meadowsweet was used for medicinal purposes. The foliage is eaten by goats, sheep, and pigs, but not by horses or cows.

The other rose of the streams, the water avens, is a sister plant of the common avens, or herb benet, of the hedgerow. It is a handsome plant with drooping,

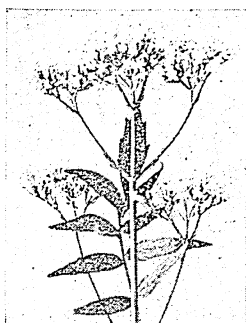
FLOWERS THAT BLOOM BY THE STREAM



WATER DROPWORT



ARROWHEAD



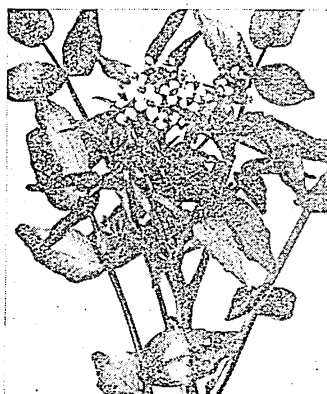
GREAT VALERIAN



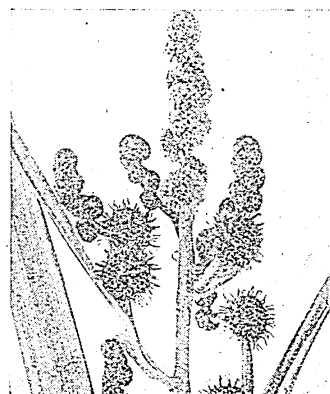
MEADOWSWEEP



WATER FIGWORT



WATERCRESS



BUR-REED



WATER CROWFOOT



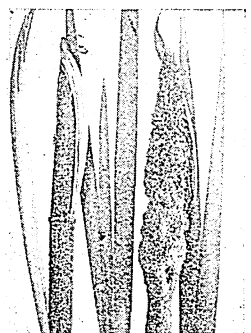
LOOSESTRIFE



SNAKE'S HEAD



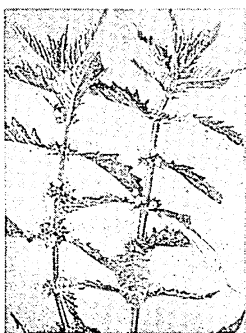
HEMP AGRIMONY



REED-MACE



SULPHUR-WORT



GIPSY-WORT



GIANT DOCK

reddish-brown flowers, and abounds in some parts of the country by riverside and in marshy fields. It was formerly used as a disinfectant, and was put into ale to prevent it turning sour, just as oil of cloves is put into paste to preserve it.

The great wild valerian is still used in medicine as a stimulant. It grows three or four feet high, and has leaves much divided, the leaflets numbering from nine to 21, and being coarsely toothed and hairy underneath. The small white flowers grow in clusters and are tinged with pink.

The most interesting thing about the great valerian is its attraction for cats and rats. It is scarcely possible to keep a plant where these animals abound, if the leaves or roots have once been bruised so as to give out their familiar scent. Cats seem to be thrown into a kind of intoxication by the scent, and will dig up the roots. Rats do the same, and in the country traps are often successfully baited with valerian. To Europeans the scent is not pleasant, but some Asiatics prize it, and use it in the preparation of various perfumes.

THE SPIKENARD WHICH WAS USED FOR ANOINTING THE FEET OF JESUS

The order to which the valerian belongs is small, but one of its most notable members is the spikenard of the New Testament. This was regarded as very precious by the ancients and it will be remembered that Judas estimated the value of the spikenard used in anointing the feet of Jesus at "three hundred pence."

Several members of the primrose family thrive in marshy places, one of the commonest being the yellow loosestrife, which is not really a loosestrife at all. It is a stout, branched plant two or three feet high, more or less downy, with oval, lance-shaped leaves, growing three or four in a whorl, and rather large, bell-shaped flowers dotted with orange.

Another primrose of the stream is the water violet, which is not a violet. It is a floating plant with large, handsome lilac flowers, each having a yellow eye, and these are arranged in whorls round a smooth succulent stem that is quite leafless. This flower stalk rises high out of the water.

Still another riverside primrose is the moneywort, or herb twopence, more commonly known in some districts as the Creeping Jenny. It is a pretty plant, quite destitute of hairs, with creeping stems that often grow more than a foot

long, and egg-shaped shining leaves. The large, cup-shaped yellow flowers grow in the axils formed by the leaves, and the whole plant drapes the river bank in a most graceful manner. It is often cultivated in rock gardens and in pots which are suspended, the leaf and flower stalks drooping gracefully all round. The leaves sometimes turn pink in autumn.

THE PURPLE LOOSESTRIFE USED IN SOME COUNTRIES AS A MEDICINE

The purple loosestrife is a real member of the loosestrife family, and in no way related to the yellow loosestrife already described among the primroses. It is an erect plant, two or three feet high, with square stems terminating in long spikes of purple flowers, arranged in whorls, with leaves beneath. It is common in ditches and marshy meadows as well as by riversides, and flowers late in the summer. In Ireland it is much used as a medicine by the peasantry, being very astringent and tonic. On the Continent, too, it is used as a remedy for dysentery and intermittent fevers, and so on.

Everybody knows the buttercup of the stream, the water crowfoot, a plant so variable that some botanists have divided it into at least nine or ten different species. Its stem either floats in water or creeps along the mud, and the lower leaves and, indeed, sometimes all of them, remain under water and are divided into many fine segments. Any leaves spread on the surface of the water are rounded and cut into a varying number of lobes. The flowers, unlike those of the bulbous buttercup of the meadow, are white. The varieties with floating leaves occur in standing waters, and those without generally in running streams. The last mentioned varieties are the plants described by Tennyson as "long mosses in the stream."

THE PLANT THE SWEDISH FARMER KEEPS NEAR HIS BEEHIVES

Of the great composite family the common butterbur spreads at a great rate in marshy meadows and on river banks. The large kidney-shaped and downy leaves are often three feet in diameter. They open after the blossoms, which form in a many-flowered head on a short, fleshy stalk. These flowers are a dull lilac in colour. Swedish farmers often plant the butterbur near their beehives on account of its early flowering, the blossoms opening as early as January. The hemp agrimony is also a composite. It is sometimes six feet

FLOWERS OF THE STREAM

high, with a reddish stem and heads of dull lilac-coloured flowers.

Another familiar plant in the edges of streams and pools and in watery ditches is the great water dock, sometimes called the giant dock. It is a picturesque plant growing sometimes as high as six feet, with sharp lance-shaped leaves often more than a foot long. The flowers, which are green, grow in crowded whorls and form a large branched raceme. The docks are closely related to the sorrels and to buckwheat.

A STREAMSIDE RELATION OF THE HEATHS THAT GROW IN DRY PLACES

Although the heaths favour dry places as a rule, one heath, the common winter-green, is often found flowering by stream and pool. In the south it is rare, but in Scotland, the north of England, and Ireland, it is frequently seen. The pale pink globular flowers grow on short stalks and are almost closed, and the round or egg-shaped leaves grow in tufts of three or four on rather long stalks.

The labiate family, which includes the mints and the hemp-nettles, has several members growing by the stream. One of these is the greater skull-cap, a handsome plant, about a foot or eighteen inches high, with long, lance-shaped leaves and large bright-blue flowers growing in the axils. Another is the common gipsy-wort, which has a creeping rootstock and runners, deeply cut leaves, and tiny white flowers dotted with red, growing in crowded whorls in the axils of the upper leaves. Still another labiate is the hairy mint, the commonest of all the mints. It grows in dense masses by the banks of rivers and wet ditches and varies greatly. Often it reaches a height of four feet, and the pale lavender flowers are very conspicuous. The whole plant has a strong and not unpleasant smell. One more labiate may be mentioned here. The marsh woundwort grows two or three feet high, is a hairy plant with long lance-shaped leaves, and dull light red flowers in a long spike. It is quite common in marshy land in the neighbourhood of ponds and streams.

WHY THE FISHERMAN DOES NOT LIKE THE WATER FIGWORT

Among the figworts of the stream is the water figwort, a tall, herbaceous plant, three to five feet high, with a square stem, smooth, heart-shaped leaves, and chocolate-brown flowers in branched racemes. The stems are hollow and succulent, but when the plant dies they become rigid.

Anglers find them a great nuisance, for their lines become entangled with them. When fresh, water figwort gives out a strong, disagreeable odour, and its taste is bitter and nauseous. Goats feed on the plant, but other animals reject it. The plant has become famous by its use at the siege of La Rochelle in 1628, when, other remedies being absent, the soldiers applied water figwort to their wounds, and, it is said, were speedily healed.

Another figwort is brooklime, a near relation of the water speedwell and a very similar plant, though smaller. It is often found growing in brooks and ditches with the watercress and water parsnip. The flowers, which are of a bright blue colour, grow in racemes.

The yellow monkey-flower, another of the figworts, is really a North American plant, cultivated in water gardens, but in many places it has escaped and established itself as a wild plant by the riverside. The flowers are large and funnel-shaped, and in the wild variety are yellow, but the cultivated varieties have blossoms blotched with red or brown.

THE SMALL CREEPING MUDWORT WHICH GROWS IN MUDDY PLACES

The name of the common mudwort indicates the situations where it is found. This applies equally to its botanical name *limosella*, which is derived from *limus*, the Latin word for mud. It is a small, creeping plant with long, narrow, spoon-shaped leaves and tiny white or pale pink flowers on short stalks.

Another figwort found in the banks of rivers and streams in Cornwall, and occasionally in other southern counties, is the Cornish money-wort. It is a dainty little plant with slender stems that creep along the ground in tangled masses and have small round, downy leaves of delicate green, and tiny pink and yellow flowers.

The common comfrey, a familiar plant of the riverside, is a member of the borage family. It is a large and handsome plant, reaching three feet, and has pointed elliptical leaves and flowers which may be white, pink, or purple, and form in drooping clusters. Though attractive in the wild, the comfrey is a great nuisance in the garden, for, as in the case of the bindweed, the roots are brittle and the smallest piece will grow into a plant. It is very difficult to get rid of when once it has taken hold of the soil.

Another borage is the tufted water scorpion grass, a sister plant of the forget-me-not, which it somewhat resembles. It is a light green plant with a much branched downy stem and long slender racemes of sky-blue flowers.

Common by streams and ponds is the water bedstraw, a weak, straggling plant about a couple of feet high, with narrow, blunt leaves, four or six in a whorl, and loose panicles of white flowers. The great willow herb, sometimes called codlins and cream, a plant familiar by rivers and ditches, belongs to the family which includes the evening primrose, and the enchanter's nightshade. It is a handsome plant, very downy, growing from three to six feet high, and having lance-shaped leaves with saw-like edges, which clasp the stem closely. The deep rose-coloured flowers measure nearly an inch across and are very fragrant. One of the sedges found in marshy places, near the sea, is the marsh sedge or carex, a plant two or three feet high, with long, narrow leaves and crowded spikelets of flowers. The sedges are much like the grasses, but differ in having solid, angular stems and are of very little use to man or beast.

THE REED-MACE WHICH IS SOMETIMES MISTAKEN FOR THE BULRUSH

The small reed-mace family consists entirely of aquatic plants among which the reed-mace and the bur-reed are typical. The great reed-mace, or cat's-tail, sometimes reaches a height of eight feet, and its club-like spike of flowers causes it often to be mistaken for the bulrush, the large rush-like scirpus. The branched bur-reed is a plant three or four feet high with sword-shaped leaves and male and female flowers in separate heads.

Several members of the parsley family are found growing by the stream-side. There is the water dropwort, a plant with a fleshy, fibrous root, a stem that sends out runners, hollow leaf stalks, leaves partly submerged, and umbels of white flowers. The plant was formerly much used as a medicine in cases of consumption and asthma. It is poisonous, and if the fruit be eaten giddiness will result and other symptoms of narcotic poisoning follow. Even horses have been poisoned by feeding on the leaves.

Another of the parsley family is sulphur-wort, sometimes called pepper saxifrage. It is a smooth plant a foot or so high, with an angular stem and umbels of dull, pale

yellow flowers. The plant gives out a fetid smell when bruised, and is said by some country people to give a bad flavour to milk and butter.

The procumbent marsh-wort is abundant in rivers and ditches, growing often with watercress for which it is sometimes mistaken. It has, however, a hollow stem and leaves with a saw-like edge that enable it to be easily distinguished from watercress. The flowers are small and white, and come out in July.

Still another parsley of the stream is the narrow-leaved water parsnip, much commoner than its sister plant the broad-leaved water parsnip. It has feathery leaves, with saw-like edges to the leaflets, and crowded umbels of small white flowers.

WHY THE WATERCRESS WAS HELD IN HIGH ESTEEM BY THE GREEKS

Of the cabbage family, among stream plants, the watercress is abundant in most parts of the country where there is running water, and often forms extensive beds near the margins of shallow streams and pools. It rarely rises more than eight or nine inches above the surface of the water. The succulent stems and rounded leaflets are too well known from its use as a salad plant to need any description here. The small white flowers open in June.

The watercress contains a pungent oil present in every part of the plant, and in addition it contains much common salt and sulphur, and also some iodine. It was probably one of the first green plants to be eaten in Europe and northern Asia, and was highly esteemed by the ancient Greeks, not only as a salad, but as a medicine. It was supposed to be particularly useful in disorders of the brain and in speaking of the half-witted the Greeks had a popular saying, "Eat cress." Xenophon recommended the Persians to give it to their children as a means of adding to their strength and stature.

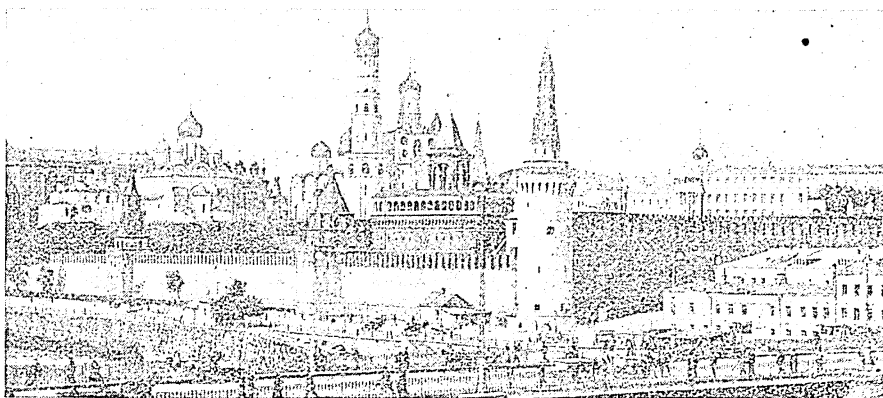
A N IMPORTANT PLANT FOR THE MARKET GARDENER NEAR THE TOWN

For centuries it has been eaten in England, but only in the nineteenth century was the plant cultivated, and now the growing of watercress is an important branch of market-gardening in the neighbourhood of most of our large towns.

A sister plant is the marsh yellow-cress, which, as its name implies, has not white but yellow flowers.

Pictures in colour of Flowers of the Stream appear in Chapter 50 of Group 10.

The Story of the Peoples of All Nations and Their Homelands



Some of the beautiful buildings in the Kremlin at Moscow

RUSSIA AS IT IS

RUSSIA reaches out to the Pacific Ocean on the east and to the Baltic on the west. On the north she looks over the Arctic seas. Southward her boundaries are the great Asiatic mountains and tablelands which were the homes of the ancestors of the European nations, the Caucasus, the highlands of Asia Minor, and the Black Sea coast.

Her territory was decreased as a result of the war. Russian Poland passed into the new Poland; Bessarabia went to Rumania; Finland, Esthonia, Lithuania, and Latvia became independent States. Yet in area she covers over 8 million square miles and her population is 131 millions. That is to say, Russia is nearly twice as large as China, though she has only about a third as many inhabitants. She is two and a half times as large as the United States of America with their population of 110 millions.

Among the reasons for the thinness of the population are the vast areas of northern Russia and northern Siberia, where the ground is frozen for long periods, and where close human settlement is impossible; and the great areas of virgin forest which make grand and profitable hunting ground for the hunter and the trapper, and provide much timber for Russia and for Western Europe, but where

the ordinary avocations of European life, agriculture and industry, are not possible. But the principal cause is that Russia remains mainly an agricultural country and has not developed on industrial lines.

Why is it that this huge area hangs together politically in spite of all the storms of war and revolution which have burst over it during the last ten years? One reason is that the Russias cover the great northern plains of Europe and Asia, and in these plains there is no real break except the Ural Mountains, and they rise gently from the plain, a series of ranges with rounded summits, and form no serious barrier to road and rail. These mountains do not descend to the Caspian Sea, but leave a large gap where the River Ural runs through the steppes to the Caspian Sea. Because of this absence of natural barriers other than the great rivers, the extension of Russian rule eastward to the Pacific and its maintenance by military operations have been easy and natural.

This plain, in reality a plateau of slight elevation, in the area of European Russia has a foundation of granite, over which the ages have spread a covering of sand and chalk and clay and, in huge areas of southern Russia, of what is called "black earth," a rich soil largely composed of the remains of vegetable matter. This black

THE FIVE CONTINENTS & 100 NATIONS & RACES THAT INHABIT THEM

COUNTRIES

earth is so rich that wheat grown there needs no manuring, and all sorts of crops grow very luxuriantly. The wide steppe country in the southern basin of the Volga, and stretching eastward across the Ural River into southern Siberia, is practically treeless, and is used principally for purposes of pasturage. East of the Caspian the salty plain is almost desert. Great areas even of the fertile districts of south Russia are treeless.

THE GREAT IMPORTANCE OF RIVER AND CANAL TRAFFIC IN RUSSIA

Everywhere the watershed slopes are very gradual, and the river currents are slow, except at the time of the melting of the snow, when the volume of water in the rivers is enormously increased. One result of the evenness of the land is that it is very easy to build canals from one river system to another, and river transport is as important in Russia as rail transport. You can load up goods in London on a steamer, take it through the Kiel Canal and the Baltic to Petrograd, and right across Russia to Persia without unloading.

In Siberia the rivers are also of enormous length. But the courses of the Obi, the Yenisei, and the Lena are northward from the Asiatic Highlands to the Arctic Ocean, or, like the Amur, eastward to the Pacific. A summer sea route brings the riches of Siberia to the countries of the West by way of the Yenisei and the Kara Sea. This does away with the long railway journey to the Baltic and Pacific ports. But the sea service is confined to a brief annual period, and the remoteness of Siberia accounts for its being economically undeveloped, though it has many kinds of mineral and vegetable wealth.

WHY RUSSIA HAS ALWAYS WANTED TO HOLD CONSTANTINOPLE

Archangel on the White Sea is frozen for many months of the year. The northern rivers are frozen in September, and only thaw in July, and even the Neva, on which Petrograd stands, is frozen from the end of November to the end of April. The way from the Black Sea ports to the Mediterranean, by which Russian grain is shipped, is dominated by Constantinople, and it may be blocked very easily in time of war. It is this lack of easy access to the great trade routes of the world that has made Russia through the ages long for the possession of Constantinople. Her situation on the Baltic has been made worse by the loss of Riga and Reval.

Then there is also the difficult climate. The great plain offers no barrier to the winds which sweep across Asia and from the northern ocean; there are no mountains to help precipitation of rain, and, except in the Far East, Russia does not feel the moderating influence of the ocean, and so is a country of extremes of temperature. In the long, cold winter the snow lies thick on the ground right down to the shores of the Caspian, though Astrakhan lies nearly as far south as Nantes.

Spring comes with a sudden splendour in Russia, and by June it is so hot over the central and southern regions that it seems inconceivable that there ever can have been snow. The long winter hinders work of every kind. In many parts the peasant hibernates in his little cottage for months, only going out when absolutely necessary. He even sleeps on the great stove which is so important a feature in his tiny home. Winter in the western districts is less severe; it becomes more rigorous as you go eastward. In the north the days are very long in summer and short in winter. At Archangel the longest day has 21 hours 48 minutes, and the shortest only 3 hours 12 minutes. Even in Petrograd there are "white nights" in summer, when it hardly grows dark at all. So far south as Moscow the summer nights are very light, and after ten in the evening the gilded domes of the churches still shine brightly in the afterglow.

A MOUNTAIN HALF A MILE HIGHER THAN MONT BLANC

Though there are no big mountains in the middle of Russia, there are mighty mountains on her southern borders. Mount Elburz, in the Caucasus Range, is a giant among mountains, 2700 feet higher than Mont Blanc. The average height of the passes of the range is 11,000 feet. There is a good military road now over one of the passes by which the traveller can go to Tiflis in Georgia; and there is a service of motor-cars passing over it. The trip is one of the wildest and the most beautiful in the world. South of the main range, in Transcaucasia, there are other great ranges stretching down into Russian Armenia. In Asia the great mountains of the Altai Range are still very little known. But all these mountains are very rich in minerals.

The plains of Russia are inhabited by a great number of races. It was across those plains that the waves of Asiatic emigration into Europe passed, the last of them, that

TYPES OF RUSSIAN PEASANTS



A FARM WORKER
IN OREL



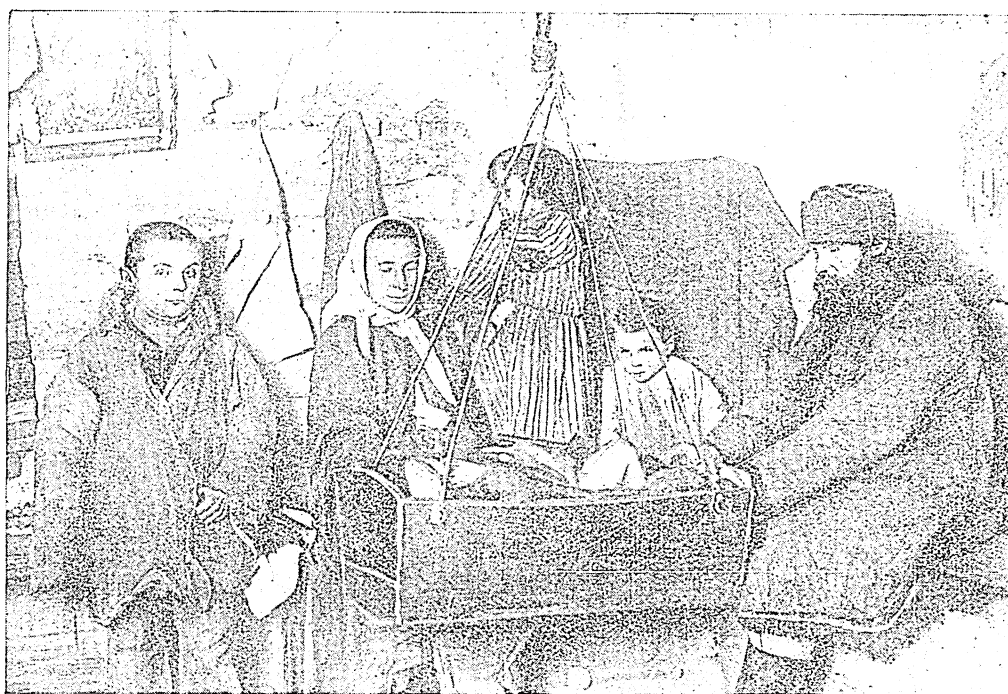
A PEASANT OF
MOSCOW



A PEASANT WOMAN
OF TVER



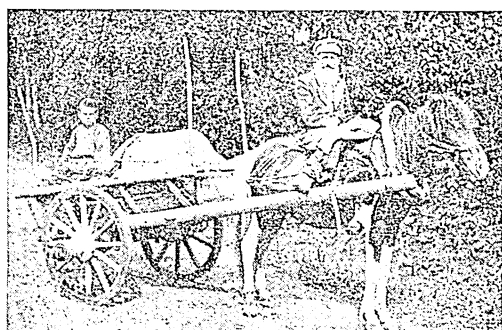
A FARMER OF
SMOLENSK



A RUSSIAN PEASANT FAMILY AT HOME



MILKMAIDS OF KIEV



A PEASANT AND HIS QUAIN'T CART

COUNTRIES

of the Golden Horde, nearly 700 years ago. So today there are patches of different races all over Russia, with their own language, religion, manners, and customs. They have kept their separateness and their differences the more easily because of the scanty means of communication. Soviet Russia has abandoned the name of Russia and is now the Union of Soviet Republics, so that every district, irrespective of race, should have a share in the government of the whole. A Soviet is a Council elected only by workers, soldiers, or peasants. But some of the Republics in the Russian Federation are not elected by Soviets, and some are not Socialist, though the larger Republics are both Soviet and Socialist. It has become the habit to speak of Russia as a Bolshevik country, but as a matter of fact the word Bolshevik has no particular significance in Russia, merely meaning the majority.

THE TWENTY-SIX REPUBLICS THAT MAKE UP THE RUSSIA OF TODAY

The Great Russians are the people who inhabit Central Russia. They are Slavs, and the purest type is tall and fair. At present this freedom of the different races is only in theory; in practice the central government ruling in the Great Russian city of Moscow has complete control in important things; but local affairs can be conducted in the local language and in accordance with local custom. In Russia now there are no less than 26 separate Republics, some of them very important like Great Russia, Ukraina, or Little Russia, and the Far Eastern Republic in eastern Siberia; but some are quite small, and little more than provinces. Georgia, Khiva, Bokhara, and Russian Armenia are among the States which are non-Russian in their inhabitants but are included in the new federation.

There is a museum in Moscow where you may see today all the peoples of the Russian Union, "in their habit as they live." The models are of wax. They wear the local national costume, and are shown with their tools and ways of living.

THE COSSACKS WHO HELD BACK THE ASIATIC INVASIONS

There are the Slav races—the Great Russians, of whom there are between 70 and 80 millions, with the costumes worn in the different "governments," as the provinces are called; the Ukrainians, smaller and darker, with a softer speech

and a love of art and colour; the White Russians who have their home in the marshy country between the Pripet and the South Dwina, and a host of others. The Cossacks of the Don belong to the Russian race, but have grown to be rather different because of the rôle they have had to play as the defenders of the steppe country against the Asiatic invasions.

The Great Russians are the principal stock from which Siberia has been peopled. Then there are many branches of the Finno-Tartar family, with rather flat faces, high cheekbones, and pronounced jaws. They are shorter in stature than the Russians. Of these there are Karelians from the borders of Finland, Samoyedes from the frozen north, and Tchuvashes from the banks of the Volga. The Tartars are dark and short people, Asiatic in type. They have a separate Republic of their own on the Volga with its capital at Kazan, and another in the Crimea. For the most part they are Mohammedan in religion.

The mountain tribes of the Urals, too, have their own little State, the Mountain Republic. They are of Turcoman blood.

THE ROVING TRIBES THAT MOVE FROM PLACE TO PLACE

The Khirgiz, who are still nomads, are Tartars. They move with their flocks and herds, and deal in horses and cattle in the country between the Urals and the Caspian Sea. Another nomad tribe in the Caspian district, the Kalmucks, are a pure Mongol type, with slanting eyes like the Chinese. They profess the Lamaism of Tibet, and settle down with difficulty in one place. Around the Caucasus is a medley of races, one of which, the Circassians, is said to be the handsomest in the world. The Circassians wear gay, bright colours: blue and rose red, or blue with bright silver accoutrements, or ornaments of inlaid black and silver.

So you will find in Central Russia, in Siberia and Ukraina, that the mass of the people speak the Russian language, in its two dialects of Great Russian and Little Russian, and belong to the Greek or Orthodox Church, the ritual of which has been handed down from the Greek Church established at Constantinople by the emperors of the East. In the towns of Ukraina is a large Jewish population. In the Tartar State the Tartar language is spoken. It looks very like Turkish in the inscriptions in the streets, and side by side with the Christian churches are mosques with tall

RUSSIA AS IT IS

minarets crowned with the crescent. Turk-estan is a purely Mohammedan State, with mosques and buildings in the Persian style. There the women are veiled, as they are in other Mohammedan countries. In the far north of Siberia, the inhabitants of Finnish type profess the Greek Church, but their customs show that they are really pagans rather than Christians.

THE GREAT BRIDGES THAT CARRY THE RAILWAYS OVER THE RIVERS

The distant parts of the Russian Union are linked up by the great Siberian Railway, which runs right across the continent of Asia from the Ural Mountains to Vladivostock. For the greater part of the way the line runs over level country, the chief difficulty from the engineering point of view being the great rivers, which require very long bridges. So precious are these bridges that they are continually guarded. The travellers in the Volga steamboats, as the boat passes underneath the great bridge near Samara, are all sent down into the saloon, and the cabin windows shut in case anyone should attempt to damage the bridge. This is part of the heritage of the civil wars. About two thousand bridges on the various Russian railways were broken down in the Great War and the civil wars which followed, and the repairing of these has been one of the most expensive and difficult tasks the Russian Government have had to face.

THE TRAIN THAT RAN OVER THE ICE ON A FROZEN LAKE

Much of the flat country over which the greater part of the Siberian railway runs is forest. The engineers who built the line had a very difficult task when they reached the mountainous country around Lake Baikal. For many years the train was ferried over, or run over the ice in the winter, but now the line runs round the mountains on the south side of the lake. This railway has facilitated the colonisation of the rich country of Siberia. Until it was built colonies were few and far between; indeed, most of them were convict colonies of people who were sent to these lonely places because they were convicted of crime, or still oftener because they held political opinions which the rulers of Russia did not like. The administration of justice has always been, and still is, very harsh in Russia, and many people were exiled for trifling offences, or for things which would not be classed as offences in freedom-loving England.

The Russian railways are very good, but the rolling stock is different from ours. The distances to be covered are so great that everybody has to be provided with sleeping accommodation. So long cars are fitted up with shelves on which the passengers can sleep. Everyone takes with him food for the journey, and when the train stops the passengers crowd out with their teapots and fill them at a great tank of hot water provided on the stations. Everyone drinks tea in Russia in great quantities, but very weak. When they are too poor to buy tea, which has been very dear, as Russia has had very little money to spend abroad since the War, they make an infusion of dried carrots or herbs and call it tea. At night the windows of the carriages are tight shut; then the shelves are pulled out, and every passenger on the train rolls himself up in a blanket, covers his face with a coat, and sleeps.

THE NATURAL WEALTH OF RUSSIA WHICH MAY MAKE HER PROSPEROUS AGAIN

For those who can afford to pay large sums of money there are the international sleeping cars, with proper beds; but these are only provided on the fast trains which run on the main routes. The engines burn coal, wood, or oil, according to the districts they serve, but usually wood.

Russia suffered as heavily as any European country during the War, and her losses in men were greater than those of any other Power; and since she fell out of the struggle she has been torn by revolution, civil war, and famine. Yet Russia may possibly recover from her troubles more rapidly than other European countries, because she has always depended less on science or industry for her prosperity than on her great natural resources. Of these the greatest is the soil.

There is first the vast wheat-growing area on the "black soil" of South Russia, in the Ukraine, the Kuban, and other districts, and the even larger areas of Central Russia and Siberia where rye is the chief crop. Rye bread, a sweet tasting black bread, and *kasha*, a kind of porridge made from millet and other grains, are the chief food of the Russian people. "The Russian peasant," says the proverb, "sells his wheat, eats his rye, and feeds his oats to his horse." Since the Revolution the peasant owns most of the land and his house. The estates of the big landowners were divided up among the peasants, in some cases. In others they were retained

COUNTRIES

as large farms run by the Government, or by cooperative societies. But often the land belongs to the village as a whole.

This is an old custom which has survived in Russia, though it has been given up in most of the other countries. The land is divided into strips, and is redistributed every nine years. Ever since 1905 attempts have been made to change this system, but it is difficult to change. The Russian village consists of a street of wooden houses crowded together for company in the long winters, and for protection in former days against the wolves. Some of the plots are miles away, and the strip system gives every man a chance of getting one piece comparatively near his house. The stacks are also crowded together, and so are the cowhouses and stables. If there is a fire it is almost impossible to prevent it from spreading. In some villages you may see dug-outs in the rear of the houses in which the peasant can take shelter for himself, his family, and his more treasured possessions in case of fire. The Russian peasant loves his live stock, and in the dairies and the stables, even on the large cooperative farms, one sees the pet names of the animals written up over their stalls.

THE CHIEF EXPORTS FROM RUSSIA IN HER HAPPIER DAYS

In good years Russia produces far more agricultural stuff than she can consume, and exports large quantities of grain, linseed, sunflower seed, and from Siberia butter and cheese. The cattle, horses, and pigs of South Russia provide large quantities of hides, tallow, and bristles for export. In sugar, Russia was nearly self-supporting before the War, the sugar being produced from the beet fields of Ukrainia. Turkestan gives her large supplies of cotton, though not nearly enough to feed her mills, for, next to agriculture, cotton is the greatest Russian industry.

Another great source of wealth is the forests, which extend for miles in nearly all the districts of Russia except the south. In the north and on the Baltic are forests of larch and pine and other coniferous trees which in normal times supply enormous amounts of building timber for the countries of western Europe.

In the centre are extensive woods of birch and pine, and farther south the woodlands contain oaks and elms. The white-stemmed birch is the most picturesque and characteristic of the Russian

forest trees. Siberia is even richer in timber, and the northern forests there also provide much wealth from the skins of the valuable fur-bearing animals, the bear, the fox, the marten, and the sable.

THE AMAZING WEALTH WHICH IS WAITING TO BE WON FROM THE EARTH

Russia has excellent supplies of coal, both ordinary and anthracite, in the Donetz Basin and in other parts of Ukrainia. These districts are also rich in iron, and there are great tracts of iron-bearing earth which have not yet begun to be worked. The Urals are rich in copper, platinum, iron, and coal, and in the Altai Mountains and the mountains of eastern Siberia there are rich mines of gold and other metals. In other districts, and especially in the Moscow district, there are good supplies of brown coal, which can be easily converted into electrical power for working the factories, the tramways, and so on.

The chief towns of Russia are provided with electrical power stations, and these are being extended, so that in a few years Russia may be one of the countries in Europe best supplied with electrical power.

It is strange, in a village that is backward according to every European standard, and where the peasants have no boots, but wear strips of cloth and linen bound round their feet, to find that electric light is available.

Then, on the plains between the Caucasus and the Black and Caspian Seas, in Azerbaijan and Georgia, of which the centres are Baku and Batum, there are rich oil wells which are one of Russia's great commercial assets. In Sakhalin, part of which has been assigned to Japan, there are also oil wells from which ships putting in at Vladivostock can be supplied. Russia's natural resources are therefore almost unlimited, but they are only beginning to be exploited because of the lack of capital and the prolonged troubles of war and revolution.

THE SAD FATE OF THE SPLENDID CITY OF PETROGRAD

Under the Tsars the capital city of Russia was St. Petersburg, or Petrograd, built by Peter the Great on the Neva to provide Russia with a window looking out to the west. It grew into a splendid city, in spite of its bad climate, due to its being built on a swamp. The presence of the Court made it the home of the whole class of civil servants and politicians.

RUSSIA AS IT IS

Great industries, especially the textile and electro-technical industries, had big factories there, and with the deepening of the Neva a considerable shipping activity was added. Between 1918 and 1922 this great and splendid city fell into ruin, and is only gradually being repaired, but its population has permanently declined because of the removal of the seat of government to Moscow. The Bolshevik Government renamed it Leningrad. But Petrograd's prosperity will revive in due time, and the broad Neva,

the banks of the Moskva River, so that they do not alter the character of the town. Moscow is gorgeous with colour, and when the traveller catches sight of it for the first time, he realises that he is nearing the East. Above the houses, the streets, and the great buildings of the modern town rise the domes of the great Orthodox churches, some glittering with gold, others painted Madonna blue or sea-green. In the centre of the city is the old white-walled city. Its walls are called in Moscow the Chinese Walls. Between



PEASANT WOMEN CARRYING THEIR PRODUCE TO MARKET

with its fine quays and splendid bridges, and the magnificent streets, the most famous of which is the Nevski Prospect, still remain the glory of the place from which for a time at least the glamour of Imperial splendour has vanished.

Moscow is a very different city. It is one of the most interesting and romantic cities of Europe. It too is a great industrial centre—the greatest in Russia. But the factories for the manufacture of cotton, electrical goods, and machinery, and a hundred other commodities are for the most part outside the city proper on

it and the Moskva River rises the Kremlin, the splendid medieval fortress which dominates the city.

The Kremlin is a walled enclosure, the walls of old red brick, and the gates all different but all beautiful. The towers are roofed with brilliant green tiles. Within the Kremlin stand the most magnificent and the most sacred of the city churches, the fine palaces of the old regime, as well as the barracks and other buildings. There, in the great palace, richly decorated within in the style of Louis the Fourteenth, the Russian

streets radiate. In the business parts of the town the houses are of brick or stone, but as soon as you get into the suburbs the characteristic low Russian wooden house, with its elaborately carved window-frames, is seen. One curious thing is the fire-tower, with a little gallery high up where the watchman stands ready to signal if there is a fire. Then there is the bazaar, a vast, outside market where nearly everybody buys his food, and often clothes and other things as well. Everywhere, in town and country, the people are poor according to our standards. The houses are inconceivably crowded in many places. In this matter Moscow is perhaps the worst. There, with the influx of all the Government officials, and traders connected with the Government, there is literally not room to live. The available space is divided out, and even so, you may find a

Government official or an important business man obliged to be content with one or at most two rooms for himself and his wife and child. In the country the whole family—grandparents, and one or two families of the sons—will continue to live in the one little wooden house.

In the winter people crowd into one room even if they have more, because they are often too poor to keep more than one room heated. But in the summer life is much gayer and happier, and everybody with any pretensions flies from the town to a little cottage in the country, and there the family lives in the open air. All the meals are taken out on the big balcony, on which you may sit out until far into the long, light night around the samovar, or tea urn, which is the centre of the family life. By this open-air life stores of health are laid up to last through the long winter.

THE SMALL COUNTRIES ROUND RUSSIA

Finland

FINLAND declared itself an independent State in 1917 and a Republic in June, 1919. It had then been a Grand-Duchy of the Russian Empire for over a hundred years, with the Russian Emperor as its Grand-Duke, and for over six hundred years before that it had been a part of Sweden, the country which brought civilisation to the Finns.

For originally the Finns were an Asiatic people, speaking, as they still do, a tongue of the Mongolian type. Under Swedish influence they have developed into one of the best-educated and, physically and morally, finest races in Europe. Their power of resisting absorption by other races has been strong. Neither the Swedes nor the Russians could cause them to weaken their hold on their Finnish individuality.

The national feeling grew throughout the nineteenth century, largely because of the publication of legendary Finnish verse, making a long epic, the Kalevala, which gave Longfellow his metre for Hiawatha, a similar revival of North American Indian legends. The building-up of a literature in the Finnish language fostered the pride of the people as a distinct race, and by their tyrannical attempts to Russianise the Finns the Russians only made them cling the more earnestly to their own methods and culture, so that everyone knew that

whenever a chance came Finland would claim independence.

Including a part of Lapland, Finland is about two and a half times as large as England, and has a population of about three and a half millions.

The capital, Helsinki (formerly Helsingfors), has 200,000 inhabitants, and Turku (formerly Abo) has about 60,000. In religion the people are almost exclusively Evangelical Lutherans.

Finland is a beautiful land of woods, lakes, and streams, but without mountains. Its chief wealth is in its forests, used for house-building, wood industries, and paper-making; and timber is exported. Agriculture is intelligently pursued, the chief crops being rye, oats, barley, and potatoes. Dairying is important. Iron is found in large quantities, and is prosperously worked. The Finns make excellent seamen and the country has a considerable mercantile fleet.

The homeland of the Finns is one of the most attractive of the smaller countries of Europe, whether to watch as a successful adopter of democratic and progressive methods, or to visit as a charming land.

Esthonia

THE newly-formed Republic of Esthonia, which declared itself independent in February, 1918, and was acknowledged by Russia as independent in December, 1919, is about three-fourths the size of Scotland. It extends along the south of

COUNTRIES

the Gulf of Finland from the River Narova and Lake Peipus westward to the Baltic Sea, and includes the Island of Dago.

Its population of over a million is almost entirely composed of Esths, a race akin to the Finns in descent and language, Lutheran in religion, and greatly superior to the Russians in education.

The Esths have always borne the Russian yoke with impatience. The work of the country is largely agricultural. Its chief crops are rye, barley, oats, potatoes, and flax. A fifth of the land is forest. The exports are timber, flax, butter, and meat. A large amount of produce passes through the country from Russia in ordinary times, and is shipped at the ancient port of Reval, or Tallinn (125,000 inhabitants), now the capital. Pernau (18,000), on the Gulf of Riga, is the next most important port. Dorpat, or Tartu (50,000), contains the national university. Narva (35,000), at the mouth of the River Narova, is the chief manufacturing town.

The frontier between Esthonia and Latvia on the south is not yet finally drawn, but the feeling between the Esths and Letts is friendly. The people of Esthonia are not to any large extent of mixed race, and in recent times they have advanced rapidly in numbers, education, and prosperity.

Latvia

LATVIA, a new Republic on the Baltic coast, the home of the Letts, a people akin in race and language to the Lithuanians, and other northern Indo-European populations, is an instance of the impossibility of crushing the instincts of any virile race. Successively the Letts have been overrun by the Germans, the Poles, the Swedes, and the Russians. Under Russia strong attempts were made to obliterate their language and individuality, but when the war ceased in 1918 they claimed their independence, and mapped out the district in which they are able to show a pronounced majority.

Latvia includes the former Russian province of Courland, part of Livonia, and part of the province of Vitebsk, but not the Island of Oesel at the mouth of the Gulf of Riga. It is a flat land of forests, lakes, and rivers, grouped about the lower course of the River Dwina. It is about five-sixths the size of Scotland, with about two millions of people.

Its work is the same as that of Esthonia: the growing of rye, oats, barley, flax, and potatoes; dairying, and, above all, the use of the timber in its plentiful forests. Its capital, Riga, has 280,000 people, and is the chief outlet for a great inland trade from as far as Siberia. Libau is the second port of the country.

The Letts are at home on the sea, and it is not easy to see how Russia will be a seafaring nation at all without them, the Esths, and the Finns.

Lithuania

LITHUANIA, the most southern of the three nations formed from the Baltic States of Russia, is the least clearly defined. Bounded by Latvia, Prussia, Poland, and Russia, it is not immediately clear how far in each direction the Lithuanian race extends as a majority. It has, however, strong historical claims to be recognised as a separate country, for about the year 1400 Lithuania was one of the great States of Eastern Europe, extending from the Baltic to the Black Sea. By the marriage of the Lithuanian king with the queen of Poland the two countries became united, and Poland later took the position of principal partner. Like Poland, Lithuania remains Roman Catholic in religion.

Comparatively early in the Great War the Lithuanians claimed their independence, but the Republic was not fully organised till 1919, owing to the occupation of the country by German forces; and a settlement was delayed by the Russian Government attacking Poland through Lithuania, while professing to acknowledge Lithuanian independence.

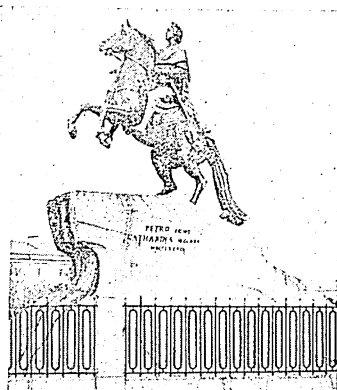
The country is about the same size as Portugal, and most of its 2,300,000 people are engaged in agriculture. Much of the land is forest, with marshy tracts. Cattle-rearing is a prominent feature, and there is much livestock. The crops cultivated are rye, oats, barley, potatoes, wheat, and flax; and the exports are taken through Riga and Lithuania's own port, Memel. Memel has 50,000 people.

The Lithuanians insist that Vilna, which has been forcibly seized and held by Poland, should be their capital. Other towns are Kaunas (Kovno) with 100,000 people, the existing capital, and Gardinas (Grodno) with 60,000.

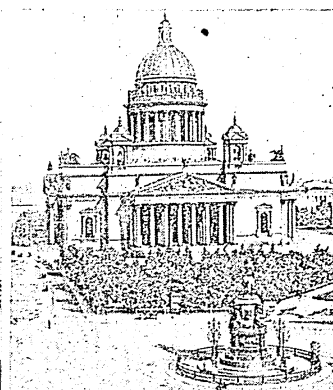
Maps of the Small Countries round Russia appear in Section 50 of Group 12.



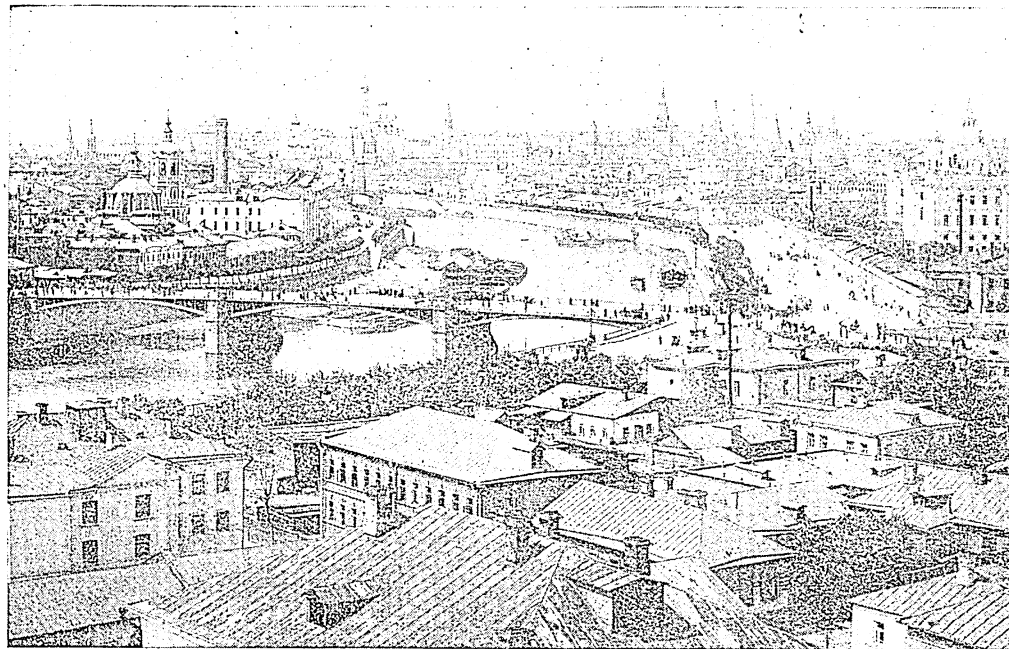
THE TOWER OF IVAN VELIKY IN
THE KREMLIN AT MOSCOW



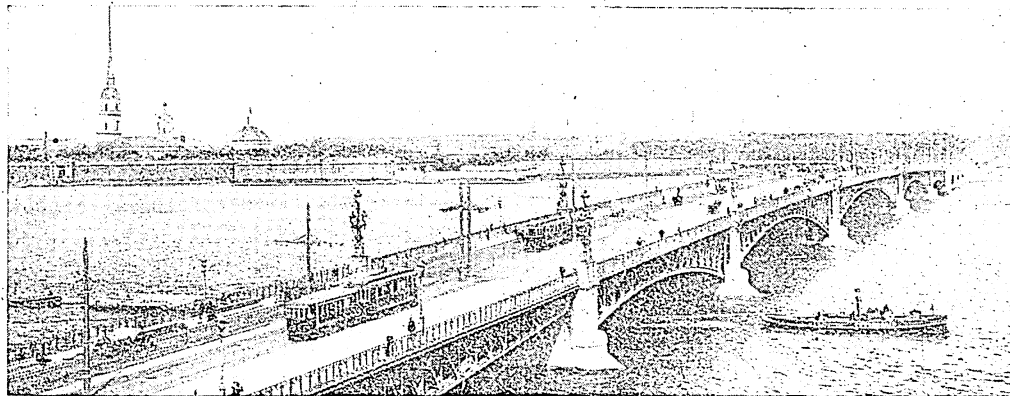
THE STATUE OF PETER THE
GREAT IN PETROGRAD



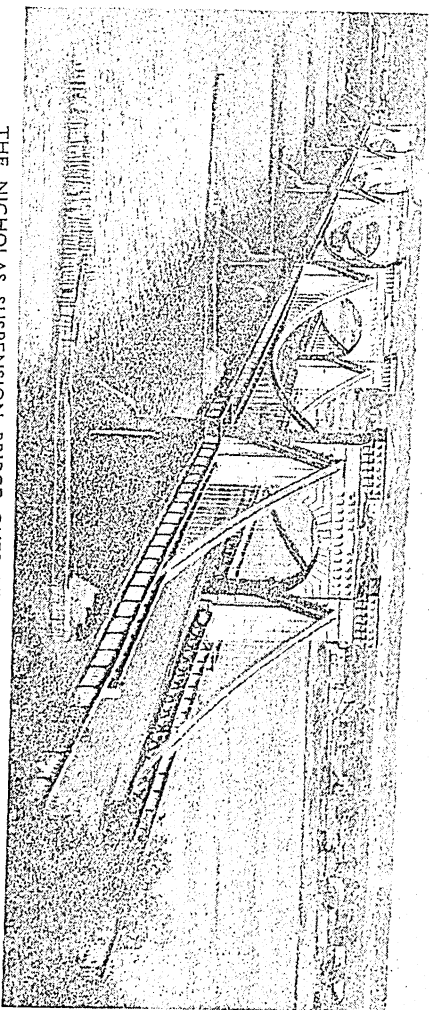
THE CATHEDRAL OF ST. ISAAC
IN PETROGRAD



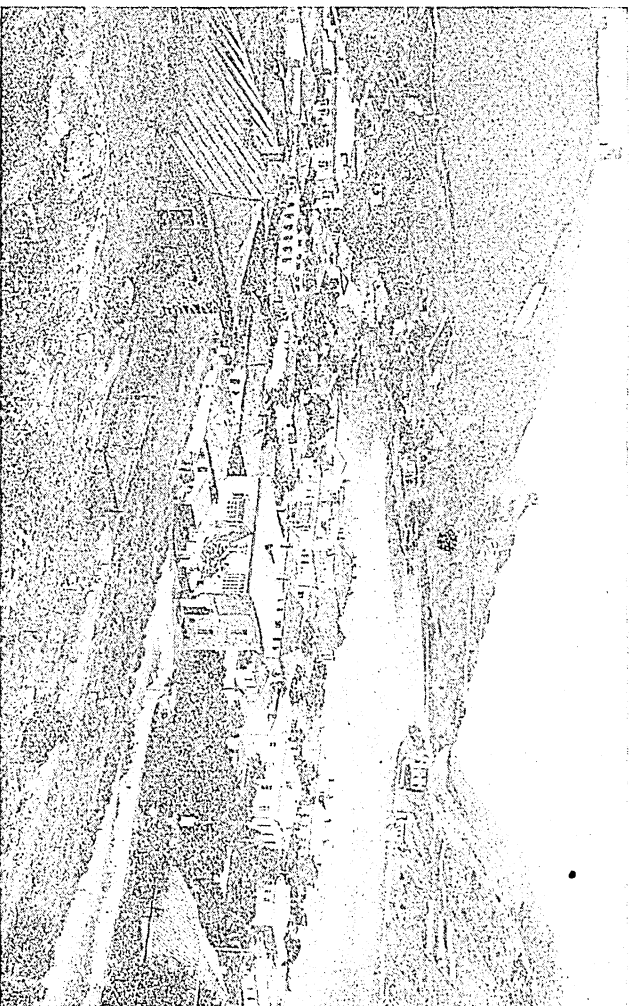
MOSCOW, THE CAPITAL OF SOVIET RUSSIA, ON THE RIVER MOSKVA



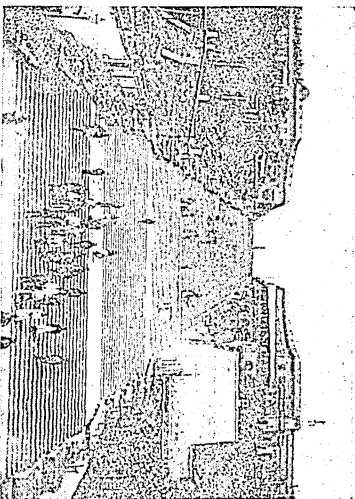
THE BRIDGE AND FORTRESS OF ST. PETER AND ST. PAUL IN PETROGRAD



THE NICHOLAS SUSPENSION BRIDGE OVER THE DNEIPER RIVER AT KIEV
6025



THE VILLAGE OF BALACLAVA, ON THE SHORES OF THE BLACK SEA



THE GREAT RICHELIEU STAIRWAY
IN ODESSA



NATIVES OUTSIDE A MOSQUE IN
BOKHARA, TURKISTAN

One Thousand Poems of All Times and All Countries



THE PIED PIPER OF HAMELIN

There is a town in Germany called Hamelin, and it is said that a strange man once charmed all its rats away, in 1284. But the legend also says that he charmed the children away

HAMELIN TOWN'S in Brunswick,
By famous Hanover city ;
The river Weser, deep and wide,
Washes its wall on the southern side ;
A pleasanter spot you never spied ;

But, when begins my ditty,
Almost five hundred years ago,
To see the townfolk suffer so
From vermin was a pity.

RATS !

They fought the dogs, and killed the cats,
And bit the babies in the cradles,
And ate the cheeses out of the vats,
And licked the soup from the cooks' own ladles,
Split open the kegs of salted sprats,
Made nests inside men's Sunday hats,
And even spoiled the women's chats,
By drowning their speaking
With shrieking and squeaking
In fifty different sharps and flats.

AT last the people in a body
To the Town Hall came flocking :
" 'Tis clear," cried they, " our Mayor's a noddy ;

And as for our Corporation—shocking
To think we buy gowns lined with ermine
For dolts that can't or won't determine
What's best to rid us of our vermin !
You hope, because you're old and obese,
To find in the furry civic robe ease ?

because the Mayor and the townsmen did not keep their promise to pay him. This old story put into verse by Robert Browning, is one of the finest poems ever written.

Rouse up, sirs ! Give your brains a racking
To find the remedy we're lacking,
Or, sure as fate, we'll send you packing ! "
At this the Mayor and Corporation
Quaked with a mighty consternation.

AN hour they sat in council ;
At length the Mayor broke silence :
" For a guilder I'd my ermine gown sell ;
I wish I were a mile hence !
It's easy to bid one rack one's brain—
I'm sure my poor head aches again,
I've scratched it so, and all in vain.
Oh, for a trap, a trap, a trap ! "
Just as he said this, what should hap
At the chamber door but a gentle tap ?
" Bless us ! " cried the Mayor, " what's that ? "

(With the Corporation as he sat,
Looking little though wondrous fat ;
Nor brighter was his eye, nor moister
Than a too-long-opened oyster,
Save when at noon his paunch grew
mutinous

For a plate of turtle green and glutinous)
" Only a scraping of shoes on the mat ?
Anything like the sound of a rat
Makes my heart go pit-a-pat ! "

COME in ! the Mayor cried, looking bigger :
And in did come the strangest figure !

POEMS · SONGS · BALLADS · VERSES AND RHYMES WITH MUSIC

A thousand guilders ! The Mayor looked
 blue ;
 So did the Corporation too.
 For council dinners made rare havoc
 With claret, moselle, vin-de-grave, hock :
 And half the money would replenish
 Their cellar's biggest butt with Rhenish.
 To pay this sum to a wandering fellow
 With a gipsy coat of red and yellow !
 " Beside," quoth the Mayor with a know-
 ing wink,
 " Our business was done at the river's
 brink ;
 We saw with our eyes the vermin sink,
 And what's dead can't come to life, I
 think.
 So, friend, we're not the folks to shrink
 From the duty of giving you something for
 drink,
 And a matter of money to put in your
 poke ;
 But as for the guilders, what we spoke
 Of them, as you very well know, was in
 joke.
 Beside, our losses have made us thrifty.
 A thousand guilders ! Come, take fifty ! "

The Piper's face fell, and he cried :
 " No trifling ! I can't wait, beside !
 I've promised to visit by dinner-time
 Bagdat, and accept the prime
 Of the head cook's pottage, all he's rich in,
 For having left, in the Caliph's kitchen,
 Of a nest of scorpions no survivor :
 With him I proved no bargain-driver,
 With you, don't think I'll bate a stiver !
 And folks who put me in a passion
 May find me pipe to another fashion."

" How ? " cried the Mayor, " d'ye think
 I'll brook
 Being worse treated than a cook ?
 Insulted by a lazy ribald
 With idle pipe and vesture piebald ?
 You threaten us, fellow ? Do your worst,
 Blow your pipe there till you burst ! "

Once more he stept into the street
 And to his lips again
 Laid his long pipe of smooth, straight
 cane ;
 And ere he blew three notes (such sweet
 Soft notes as yet musician's cunning
 Never gave the enraptured air)
 There was a rustling that seemed like a
 bustling
 Of merry crowds justling at pitching and
 hustling,
 Small feet were pattering, wooden shoes
 clattering,

Little hands clapping and little tongues
 chattering,
 And, like fowls in a farmyard, when barley
 is scattering,
 Out came the children running.
 All the little boys and girls,
 With rosy cheeks and flaxen curls,
 And sparkling eyes and teeth like pearls,
 Tripping and skipping, ran merrily after
 The wonderful music with shouting and
 laughter.

The Mayor was dumb, and the Council
 stood
 As if they were changed into blocks of
 wood,

Unable to move a step, or cry
 To the children merrily skipping by,
 And could only follow with the eye
 That joyous crowd at the Piper's back.
 But how the Mayor was on the rack,
 And the wretched Council's bosoms beat,
 As the Piper turned from the High Street
 To where the Weser rolled its waters
 Right in the way of their sons and
 daughters !

However, he turned from South to West,
 And to Koppelberg Hill his steps ad-
 dressed.

And after him the children pressed ;
 Great was the joy in every breast.
 " He never can cross that mighty top !
 He's forced to let the piping drop,
 And we shall see our children stop ! "
 When, lo, as they reached the mountain-
 side,

A wondrous portal opened wide,
 As if a cavern was suddenly hollowed :
 And the Piper advanced and the children
 followed.

And when all were in to the very last,
 The door in the mountain-side shut fast.
 Did I say all ? No ! One was lame,
 And could not dance the whole of the
 way ;

And in after years, if you would blame
 His sadness, he was used to say :
 " It's dull in our town since my playmates
 left !

I can't forget that I'm bereft
 Of all the pleasant sights they see,
 Which the Piper also promised me.
 For he led us, he said, to a joyous land,
 Joining the town and just at hand,
 Where waters gushed and fruit trees grew,
 And flowers put forth a fairer hue,
 And everything was strange and new.
 The sparrows were brighter than peacocks
 here,
 And their dogs outran our fallow deer,

POETRY

THE MAN WITH THE HOE

This grim poem is from the pen of Edwin Markham, a conspicuous American poet, who was born in 1852. It was written after the poet had seen the celebrated painting by the great French artist Jean François Millet entitled *The Man with the Hoe*, of which a reproduction is given on this page. The poet was so struck with the attitude of the man in the painting, the hopelessness of his life, the misery of his ill-rewarded toil, his utter lack of all the bright, intellectual gifts that lift man so immeasurably above the brute creation, that in a passion of pity he penned this poem. It has been said that the poet exaggerates the debasing influence of field labour, but there is much truth in his outburst.

BOWED by the weight of centuries, he leans
Upon his hoe, and gazes on the ground,
The emptiness of ages in his face,
And on his back the burden of the world.

To trace the stars and search the heavens
for power ;
To feel the passion of Eternity ?
Is this the dream He dreamed who shaped
the suns
And pillared the blue firmament with
light ?
Down all the stretch of hell to its last gulf
There is no shape more terrible than this,
More tongued with censure of the world's
blind greed,
More filled with signs and portents for the
soul,
More fraught with menace to the universe.
What gulfs between him and the seraphim !
Slave of the wheel of labour, what to him
Are Plato and the swing of Pleiades ?



THE MAN WITH THE HOE—BY JEAN FRANÇOIS MILLET

Who made him dead to rapture and
despair,
A thing that grieves not, and that never
hopes,
Stolid and stunned, a brother to the ox ?
Who loosened and let down this brutal
jaw ?
Whose was the hand that slanted back
this brow ?
Whose breath blew out the light within
this brain ?
Is this the thing the Lord God made and
gave
To have dominion over sea and land ;

What the long reaches of the peaks of song,
The rift of dawn, the reddening of the rose ?
Through this dread shape the suffering
ages look ;
Time's tragedy is in that aching stoop ;
Through this dread shape humanity be-
trayed,
Plundered, profaned, and disinherited,
Cries protest to the Judges of the World,
A protest that is also prophecy.
O masters, lords, and rulers in all lands,
Is this the handiwork you give to God—
This monstrous thing distorted and soul-
quenched ?

POETRY

How will you ever straighten up this shape;
Touch it again with immortality;
Give back the upward looking and the
light:
Rebuild in it the music and the dream;
Make right the immemorial infamies,
Perfidious wrongs, immedicable woes?
O masters, lords, and rulers in all lands,
How will the Future reckon with this Man?
How answer his brute question in that hour
When whirlwinds of rebellion shake the
world?
How will it be with kingdoms and with
kings—
With those who shaped him to the thing
he is—
When this dumb Terror shall reply to God,
After the silence of the centuries?

A MATCH

This is one of the most popular of the poems of Algernon Charles Swinburne, most of which are exercises in verbal melody. It sounds melodious, and as if it ought to have a meaning as sweet as the sound, but it is a poem that does not easily condense into clear thought.

If love were what the rose is,
And I were like the leaf,
Our lives would grow together
In sad or singing weather,
Blown fields or flowerful closes,
Green pleasure or grey grief;
If love were what the rose is,
And I were like the leaf.

If I were what the words are,
And love were like the tune,
With double sound and single
Delight our lips would mingle,
With kisses glad as birds are
That get sweet rain at noon;
If I were what the words are,
And love were like the tune.

If you were life, my darling,
And I your love were death,
We'd shine and snow together
Ere March made sweet the weather
With daffodil and starling
And hours of fruitful breath;
If you were life, my darling,
And I your love were death.

If you were thrall to sorrow,
And I were page to joy,
We'd play for lives and seasons
With loving looks and treasons
And tears of night and morrow
And laughs of maid and boy;
If you were thrall to sorrow,
And I were page to joy.

If you were April's lady,
And I were lord in May,
We'd throw with leaves for hours
And draw for days with flowers,
Till day like night were shady
And night were bright like day;
If you were April's lady,
And I were lord in May.

If you were queen of pleasure,
And I were king of pain,
We'd hunt down love together,
Pluck out his flying-feather,
And teach his feet a measure,
And find his mouth a rein;
If you were queen of pleasure,
And I were king of pain.

HUNTING SONG

This hunting song by Sir Walter Scott appeared in the preface to his first novel, *Waverley*. It is in tune with the breezy life he loved in the country. At that time men had only half emerged from the period when they hunted for a living, and animal slaughter was regarded as the finest form of sport. Many think differently now, but Scott, though an animal lover, appears to have no such qualms.

WAKEN, lords and ladies gay,
On the mountain dawns the day;
All the jolly chase is here,
With hawk, and horse, and hunting-spear!
Hounds are in their couples yelling,
Hawks are whistling, horns are knelling,
Merrily, merrily, mingle they,
Waken, lords and ladies gay.

Waken, lords and ladies gay,
The mist has left the mountain grey,
Springlets in the dawn are steaming,
Diamonds on the brake are gleaming:
And foresters have busy been
To track the buck in thicket green;
Now we come to chant our lay,
Waken, lords and ladies gay.

Waken, lords, and ladies gay,
To the greenwood haste away:
We can show you where he lies,
Fleet of foot, and tall of size;
We can show the marks he made
When 'gainst the oak his antlers frayed;
You shall see him brought to bay,
Waken, lords and ladies gay.

Louder, louder chant the lay,
Waken, lords and ladies gay!
Tell them youth, and mirth, and glee,
Run a course as well as we;
Time, stern huntsman! who can baulk,
Staunch as hound, and fleet as hawk:
Think of this, and rise with day,
Gentle lords and ladies gay.

POETRY

EACH IN HIS OWN TONGUE

This poem is an instance of a single composition making an author known wherever English is spoken. The writer is Professor William Herbert Carruth, of Kansas University. The idea is that the indwelling power of God manifests itself in many forms, named by many names, such as progress, aspiration, love of beauty, and devotion to duty. All the impulses which tend towards a better state, or call us to an imagined perfection, or open our eyes and hearts to what is lovely, or brace us for unselfish service, are divine though in detail they may be called by lowlier names.

A FIRE-MIST and a planet,
A crystal and a cell,
A jelly-fish and a saurian,
And a cave where the cave-men dwell :
Then a sense of law and beauty,
A face turned from the clod :
Some call it Evolution,
And others call it God.

Like tides on the crescent sea-beach
When the moon is new and thin,
Into our hearts high yearnings
Come welling and surging in,
Come from the mystic ocean,
Whose rim no foot has trod :
Some of us call it Longing,
And others call it God.

A haze on the far horizon,
The infinite, tender sky,
The ripe, rich tint of the cornfields,
And the wild geese flying high,
All over upland and lowland
The charm of the golden-rod :
Some of us call it Autumn,
And others call it God.

A picket frozen on duty,
A mother starved for her brood,
Socrates drinking the hemlock,
And Jesus on the rood,
And millions who, humble and nameless,
The straight, hard pathway trod :
Some call it Consecration,
And others call it God.

A BOY'S THANKSGIVING

The very least that we all owe in this world is gratitude for our lives. Nowhere has that gratitude been more truly and simply expressed than in this poem by a boy, Richard Molesworth Dennis, who was killed in the Great War. If boyhood has such thankfulness, how much more should it be felt by those who are privileged to live long !

GOD's gifts so many a pleasure bring
That I will make a thanksgiving.

For eyes whereby I clearly see
The many lovely things there be ;

For lungs to breathe the morning air,
For nose to smell its fragrance rare ;

For tongue to taste the fruits that grow,
For birds that sing and flowers that blow ;

For limbs to climb, and swim, and run,
And skin to feel the cheerful sun :

For sun and moon and stars in heaven
Whose gracious light is freely given :

The river where the green weed floats,
And where I sail my little boats :

The sea, where I can bathe and play,
The sands, where I can race all day :

The pigeons wheeling in the sun,
Who fly more quick than I can run :

The winds that sing as they rush by,
The clouds that race across the sky :

The pony that I sometimes ride,
The curly dog that runs beside :

The shelter of the shady woods,
Where I may spend my lonely moods :

The gabled house that is my home,
The garden where I love to roam.

And bless my parents every day,
Though they be very far away.

Take Thou my thanks, O God above,
For all these tokens of Thy love.

And when I am a man do Thou
Make me as grateful then as now.

GOD BLESS OUR NATIVE LAND

National anthems are often inclined to be warlike and boastful, but here is a national hymn which everyone may sing without regrets and with a pure heart ; for while it is truly patriotic its prayer embraces all mankind. The writer, William Edward Hickson, lived from 1802 to 1870.

GOD bless our native land !
May heaven's protecting hand
Still guard our shore ;
May Peace her power extend,
Foe be transformed to friend,
And Britain's rights depend
On war no more.

May just and righteous laws
Uphold the public cause
And bless our isle.
Home of the brave and free,
The land of liberty,
We pray that still on thee
Kind heaven may smile.

And not this land alone,
But be Thy mercies known
From shore to shore.
Lord, make the nations see
That men should brothers be,
And form one family
The wide world o'er.

THE CATARACT OF LODORE

The Falls of Lodore are in the English lake country, not far from the house of Robert Southey, who wrote this poem when he was Poet Laureate. The Cataract of Lodore is not of a high order as poetry, but as an exercise in rhyme, imitating the movement of the water, it is very clever.

How does the water
Come down at Lodore?
My little boy asked me
Thus, once on a time;
And moreover he tasked me
To tell him in rhyme.
Anon at the word,
There first came one daughter
And then came another,
To second and third
The request of their brother,
And to hear how the water
Comes down at Lodore,
With its rush and its roar,
As many a time
They had seen it before.
So I told them in rhyme,
For of rhymes I had store;
And 'twas in my vocation
For their recreation
That so I should sing;
Because I was Laureate
To them and the King.

From its sources which well
In the Tarn on the fell,
From its fountains
In the mountains,
Its rills and its gills;
Through moss and through brake,
It runs and it creeps
For awhile, till it sleeps
In its own little lake.
And thence at departing,
Awakening and starting,
It runs through the reeds
And away it proceeds,
Through meadow and glade,
In sun and in shade,
And through the wood-shelter,
Among crags in its flurry,
Helter-skelter,
Hurry-scurry.
Here it comes sparkling,
And there it lies darkling,
Now smoking and frothing
Its tumult and wrath in,
Till in this rapid race
On which it is bent,
It reaches the place
Of its steep descent.

The cataract strong
Then plunges along,

Striking and raging
As if a war waging,
Its caverns and rocks among:
Rising and leaping,
Sinking and creeping,
Swelling and sweeping,
Showering and springing,
Flying and flinging,
Writhing and ringing,
Eddying and whisking,
Spouting and frisking,
Turning and twisting,
Around and around
With endless rebound;
Smiting and fighting,
A sight to delight in;
Confounding, astounding,
Dizzying and deafening the ear with its
sound.

Collecting, projecting,
Receding and speeding,
And shocking and rocking,
And darting and parting,
And threading and spreading,
And whizzing and hissing,
And dripping and skipping,
And hitting and splitting,
And shining and twining,
And rattling and battling,
And shaking and quaking,
And pouring and roaring,
And waving and raving,
And tossing and crossing,
And flowing and going,
And running and stunning,
And foaming and roaming,
And dinning and spinning,
And dropping and hopping,
And working and jerking,
And guggling and struggling,
And heaving and cleaving,
And moaning and groaning;

And glittering and frittering,
And gathering and feathering,
And whitening and brightening,
And quivering and shivering,
And hurrying and skurrying,
And thundering and floundering,
Dividing and gliding and sliding,
And falling and brawling and sprawling,
And driving and riving and striving,
And sprinkling and twinkling and
wrinkling,
And sounding and bounding and rounding,
And bubbling and troubling and doubling,
And grumbling and rumbling and tumbling,
And clattering and battering and shatter-
ing.

Retreating and beating and meeting and sheeting,
 Delaying and straying and playing and spraying,
 Advancing and prancing and glancing and dancing,
 Recoiling, turmoiling and toiling and boiling,
 And gleaming and streaming and steaming and beaming,
 And rushing and flushing and brushing and gushing,
 And flapping and rapping and clapping and slapping,
 And curling and whirling and purling and twirling,
 And thumping and plumping and bumping and jumping,
 And dashing and flashing and splashing and clashing;
 And so never ending, but always descending,
 Sounds and motions for ever and ever are blending,
 All at once and all o'er, with a mighty uproar,
 And this way the water comes down at Lodore.

THE PRAYER OF ROBERT HERRICK

Robert Herrick, the dainty parson-poet of rural life, belonged to a time when death was regarded by men as a very fearful thing, partly because they had not fully realised the love that reigns in the heart of God. This prayer of his shows how far he was from serenity of spirit. It may be considered a milestone by the pathway of religious history.

In the hour of my distress,
 When temptations me oppress,
 And when I my sins confess,
 Sweet Spirit, comfort me!

When I lie within my bed,
 Sick in heart and sick in head,
 And with doubts discomfited,
 Sweet Spirit, comfort me!

When the house doth sigh and weep,
 And the world is drowned in sleep,
 Yet mine eyes the watch do keep,
 Sweet Spirit, comfort me!

When the passing bell doth toll,
 And the Furies in a shoal
 Come to fright a parting soul,
 Sweet Spirit, comfort me!

When the tapers now burn blue,
 And the comforters are few,
 And that number more than true,
 Sweet Spirit, comfort me!

When the priest his last hath prayed,
 And I nod to what is said,
 'Cause my speech is now decayed,
 Sweet Spirit, comfort me!

When, God knows, I'm tossed about
 Either with despair or doubt:
 Yet before the glass be out,
 Sweet Spirit, comfort me!

When the Judgment is revealed,
 And that opened which was sealed,
 When to Thee I have appealed,
 Sweet Spirit, comfort me!

PHILOMEL

Philomel, in this lovely sonnet by John Keats, means the nightingale. The first line of the sonnet is taken from Milton's *Paradise Lost*, but it is used by Keats to introduce a continuing thought of exquisite beauty.

To one who has been long in city pent
 'Tis very sweet to look into the fair
 And open face of heaven—to breathe a prayer
 Full in the smile of the blue firmament.
 Who is more happy when, with heart's content,
 Fatigued he sinks into some pleasant lair

Of wavy grass, and reads a debonair
 And gentle tale of love and languishment?
 Returning home at evening, with an ear
 Catching the notes of Philomel, an eye
 Watching the sailing cloudlet's bright career,

He mourns that day so soon has glided by:
 E'en like the passage of an angel's tear
 That falls through the clear ether silently.

THIS LIFE, WHICH SEEMS SO FAIR

This descriptive reflection is by William Drummond, laird of Hawthornden, who, in the reigns of James and Charles the First, cultivated the muse in Scotland in the English style.

This Life, which seems so fair,
 Is like a bubble blown up in the air
 By sporting children's breath,
 Who chase it everywhere
 And strive who can most motion it bequeath.
 And though it sometimes seem of its own might
 Like to an eye of gold to be fixed there,
 And firm to hover in that empty height,
 That only is because it is so light.
 But in that pomp it doth not long appear;
 For when 'tis most admired, in a thought,
 Because it erst was nought, it turns to nought.

POETRY

THE BATTLE OF BLENHEIM

Custom blinds our eyes to the badness of many things, and war is one of them. The old grandfather Kaspar, in this poem by Robert Southey, is so accustomed to war, though he knows its horrors, that it seems to him a rather fine thing—a pathway to fame. But the grandchildren instinctively feel its wickedness and uselessness, and get nearer the truth. Southey was not a great poet, but in these natural verses he reaches perfection in simple narrative.

It was a summer evening,
 Old Kaspar's work was done,
 And he before his cottage door
 Was sitting in the sun ;
 And by him sported on the green
 His little grandchild Wilhelmine.
 She saw her brother Peterkin
 Roll something large and round,
 Which he beside the rivulet,
 In playing there had found ;
 He came to ask what he had found
 That was so large and smooth and round.
 Old Kaspar took it from the boy,
 Who stood expectant by ;
 And then the old man shook his head,
 And with a natural sigh,
 ' 'Tis some poor fellow's skull,' said he,
 ' Who fell in the great victory.'
 ' I find them in the garden,
 For there's many here about,
 And often when I go to plough
 The ploughshare turns them out ;
 For many thousand men,' said he,
 ' Were slain in the great victory.'
 ' Now tell us what 'twas all about,'
 Young Peterkin he cries ;
 And little Wilhelmine looks up
 With wonder-waiting eyes.
 ' Now tell us all about the war,
 And what they fought each other for.'
 ' It was the English,' Kaspar cried,
 ' Who put the French to rout ;
 But what they fought each other for
 I could not well make out.
 But everybody said,' quoth he,
 ' That 'twas a famous victory.'
 ' My father lived at Blenheim then,
 Yon little stream hard by ;
 They burned his dwelling to the ground,
 And he was forced to fly ;
 So with his wife and child he fled,
 Nor had he where to rest his head.
 ' With fire and sword the country round
 ' Was wasted far and wide,
 And many a childing mother then
 And new-born baby died.
 But things like that, you know, must be
 At every famous victory.

' They say it was a shocking sight
 After the field was won ;
 For many thousand bodies here
 Lay rotting in the sun ;
 But things like that, you know, must be
 After a famous victory.

' Great praise the Duke of Marlbro' won,
 And our good Prince Eugene.'
 ' Why, 'twas a very wicked thing !'
 Said little Wilhelmine.
 ' Nay, nay, my little girl,' quoth he,
 ' It was a famous victory !

' And everybody praised the Duke
 Who this great fight did win.'
 ' But what good came of it at last ?
 Quoth little Peterkin.
 ' Why, that I cannot tell,' said he,
 ' But 'twas a famous victory.'

THE DAY OF THE LORD IS AT HAND

This vigorous call to serve boldly all good causes, by Charles Kingsley, remains always true, for every age has new battles to fight for righteousness and new enemies to resist.

THE Day of the Lord is at hand, at hand :
 Its storms roll up the sky ;
 The nations sleep starving on heaps of
 gold ;
 All dreamers toss and sigh.

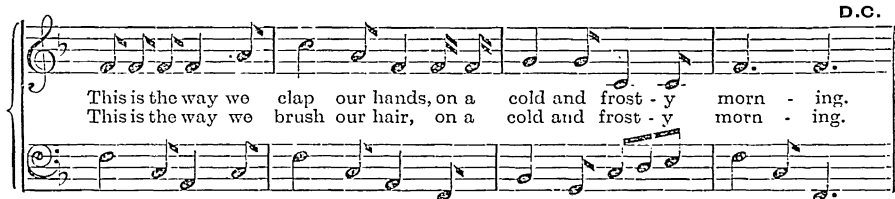
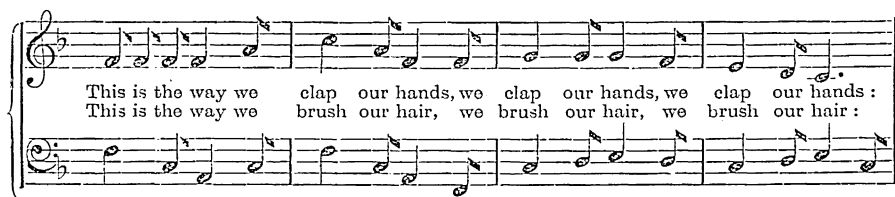
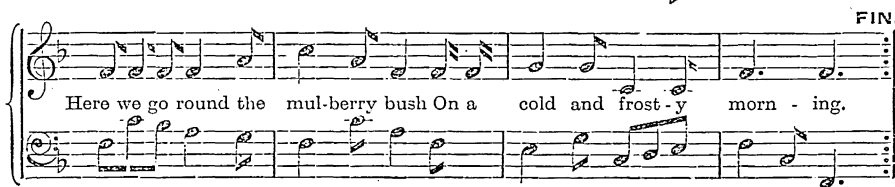
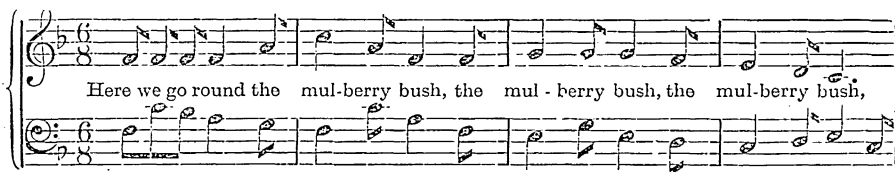
Gather you, gather you, angels of God,
 Freedom and Mercy and Truth ;
 Come ! for the Earth is grown coward and
 old,

Come down, and renew us her youth.
 Wisdom, Self-Sacrifice, Daring, and Love,
 Haste to the battlefield, stoop from
 above,
 To the Day of the Lord at hand.

Gather you, gather you, hounds of hell,
 Famine and Plague and War ;
 Idleness, Bigotry, Cant, and Misrule,
 Gather, and fall in the snare !
 Hireling and Mammonite, Bigot and
 Knave,
 Crawl to the battlefield, sneak to your
 grave,
 In the Day of the Lord at hand.

Who would sit down and sigh for a lost age
 of gold
 While the Lord of all ages is here ?
 True hearts will leap up at the trumpet of
 God,
 And those who can suffer can dare.
 Each old age of gold was an iron age too,
 And the meekest of saints may find stern
 work to do,
 In the Day of the Lord at hand.

THE MULBERRY BUSH



Intonsell

LITTLE VERSES FOR VERY LITTLE PEOPLE

HEAVEN KEEP MY GIRL FOR ME

BROWN eyes, straight nose;
Dirt pies, rumpled clothes;
Torn books, spoilt toys;
Arch looks, unlike a boy's;
Little rages, obvious arts
(Three her age is); cakes, tarts;
Falling down off chairs;
Breaking crown down stairs;
Catching flies on the pane;
Deep sighs—cause not plain;
Bribing you with kisses
For a few farthing blisses;
Wide awake, as you hear,
"Mercy's sake, quiet, dear!"
New shoes, new frock;
Vague views of what's o'clock
When it's time to go to bed,
And scorn sublime for what is said;
Folded hands, saying prayers;
Understands not, nor cares;
Thinks it odd, smiles away;
Yet may God hear her pray!
Bedgown white, kiss dolly;
Good-night! that's Polly.
Last asleep, as you see;
Heaven keep my girl for me!

William Brighty Rands

KINDNESS TO ANIMALS

LITTLE children, never give
Pain to things that feel and live.
Let the gentle robin come
For the crumbs you save at home;
As his meat you throw along
He'll repay you with a song.
Never hurt the timid hare,
Peeping from her green grass lair,
Let her come and sport and play
On the lawn at close of day.
The little lark goes soaring high
To the bright windows of the sky,
Singing as if 'twere always spring,
And fluttering on an untired wing,
Oh! let him sing his happy song,
Nor do these gentle creatures wrong.

Anonymous

THE LITTLE GENTLEMAN

MAKE your meals, my little man,
Always like a gentleman;
Wash your face and hands with care,
Change your shoes, and brush your hair;
Then, so fresh, and clean, and neat,
Come and take your proper seat:
Do not loiter and be late,
Making other people wait;
Do not rudely point or touch;
Do not eat and drink too much;

Finish what you have before
You even ask or send for more;
Never crumble or destroy
Food that others might enjoy;
They who idly crumbs will waste
Often want a loaf to taste!
Never spill your milk or tea,
Never rude or noisy be;
Never choose the daintiest food,
Be content with what is good;
Seek in all things that you can
To be a little gentleman.

Anonymous

HOW THE LEAVES CAME DOWN

I'LL tell you how the leaves came down.
The great Tree to his children said:
"You're getting sleepy, Yellow and
Brown,
Yes, very sleepy, little Red.
It is quite time to go to bed."

"Ah!" begged each silly, pouting leaf,
"Let us a little longer stay;
Dear Father Tree, behold our grief!
'Tis such a very pleasant day,
We do not want to go away."

So, just for one more merry day
To the great Tree the leaflets clung,
Frolicked and danced, and had their way,
Upon the autumn breezes swung,
Whispering all their sports among;

"Perhaps the great Tree will forget,
And let us stay until the spring,
If we all beg, and coax, and fret."
But the great Tree did no such thing;
He smiled to hear them whispering.

"Come, children, all to bed," he cried;
And, ere the leaves could urge their
prayer,

He shook his head, and far and wide,
Fluttering and rustling everywhere,
Down sped the leaflets through the air.

I saw them; on the ground they lay,
Golden and red, a huddled swarm,
Waiting till one from far away,
White bedclothes heaped upon her arm,
Should come to wrap them safe and
warm.

The great bare Tree looked down and
smiled.

"Good-night, dear little leaves," he said.
And from below each sleepy child
Replied, "Good-night," and murmured,
"It is so nice to go to bed!"

Susan Coolidge

Imperishable Thoughts of Men Enshrined in the Books of the World

Shakespeare's Comedies

We have given examples of the tales told by the first great English poet Chaucer, and also by Spenser in his *Faery Queen*; and now we come to Shakespeare, the greatest of all the poets. Many of his songs and fine passages are found in our poetry pages, but in this section we glance at his great plays, the Comedies, Tragedies, Histories, and Fantasies. Here we outline the stories of ten of his Comedies. A poet can only be known by reading him in his own words, but first it may be well to tell each story briefly as an introduction to the poet's own manner of telling it. A Comedy is a picture of human life that leads brightly to a happy ending. The Comedies summarised here are arranged in the order in which Shakespeare wrote them. That is the best way, because the poet's skill as a writer grew as he wrote more plays. The earliest plays depend chiefly on their plots, and on the clearing up of a tangle of difficulties. It is so in *The Two Gentlemen of Verona* and *The Comedy of Errors*. But later, as in *The Merchant of Venice* and *As You Like It*, Shakespeare displayed a wider view of life and character and a deeper thought.

THE TWO GENTLEMEN OF VERONA

THERE were two gentlemen in the town of Verona, named Valentine and Proteus, who were friends and close companions, until one of them fell in love with a lady of Verona named Julia. It was Proteus who had fallen in love, and that was quite a good reason for his refusing to accompany Valentine on his travels, though perhaps not so good a reason for Valentine to make fun of him. So Valentine set out on his travels alone, going first to Milan.

Meanwhile, thanks to an uncle of Proteus, the father of that young gentleman had been urged to send his son away, so that, when he grew old, Proteus might have no reason to regret that in his youth he had been a stay-at-home, and had neglected to see the world. His father, Antonio, therefore sent his son after Valentine to Milan, that he might have the company of his friend, which he had before refused.

When Proteus reached Milan the comedy had begun, for, behold Valentine, who had scoffed at his friend for being in love with Julia, now himself deeply in love with Silvia, the bewitching daughter of the Duke of Milan. And his case was worse, for, being poor, he could not hope that the Duke would let him marry his

daughter; whereas Proteus was at least in love with a lady of his own station in life. Like Romeo with his Juliet, Valentine's only plan was to marry his Silvia without her father's consent, and he had quite made up his mind to climb to her window and carry her away, when Proteus overtook him in Milan.

Valentine's scheme was quickly upset, for no sooner had he disclosed it to his friend than Proteus, on seeing the lovely Silvia, also fell in love with her, and began to forget his Julia left in Verona. Nay, worse; he betrayed Valentine's intentions to the Duke.

The Duke now wished to convict Valentine of his intention to abduct Silvia, without disclosing to him how he had come by the knowledge of the plan. So, pretending that he himself was in love with a widow of Milan, he asked Valentine what he would advise him to do—rather a foolish question, one might think, for a duke who had already been married to ask a young man who was still unwedded. But the wisdom of the Duke lay in the fact that he knew none to be so foolish as a young man in love.

Judge if the Duke was wise or foolish when Valentine innocently advised him to do exactly what he had himself

purposed doing—to carry away the lady. He even lent the Duke his own coat as a disguise, and in the pocket of the coat the Duke found a letter from Valentine addressed to his own daughter.

This discovery gave the Duke an excuse for banishing Valentine from Milan, and he now set about his own plans to marry Silvia with all speed to a foolish young nobleman named Thurio; but he enlisted the services of Proteus to help forward the match, little thinking that Valentine's friend was in love with Silvia.

Proteus was expected to give so poor an account of Valentine to Silvia, and so glowing an account of Thurio, that the maiden could not but decide to forget Valentine in favour of the foolish nobleman. But, of course, Proteus did nothing of the kind. He made his own suit to the lady, and plainly showed her that he was in love with her.

One night, Proteus, with Thurio and some musicians, came beneath the lattice window of Silvia in the court of the palace, and sang a love-song to her.

But Silvia was not the only lady who heard this love-song. Julia, no longer able to endure the absence of her lover, had left Verona disguised as a page, and, following Proteus to Milan, she had overheard this song.

When Proteus thinks himself alone, he declares his love to Silvia, who comes to the window, but she chides him for his faithlessness to his friend Valentine, to whom she declares herself betrothed; and he tells her that both the lady he loved at Verona and Valentine are dead, and pleads to have Silvia's portrait. This she promises him, saying that she is loth to be worshipped by him, but as she believes him false he is the better fitted "to worship shadows and adore false shapes," meaning that he can admire her portrait, but need not admire herself, as she does not care for him. All this is overheard by Julia, hidden in the shadow.

Next day Proteus sends Julia—who, disguised as a boy, has applied to him to be employed as his page—for the portrait, and gives her a ring to take to Silvia, the very ring Julia herself had given him before he left Verona. She is comforted to find that Silvia rejects his suit, and that she is displeased with him for his faithlessness.

Silvia, true to Valentine, has determined to escape from Milan, and by the aid of a courtier named Eglamour she sets off towards Mantua. But in a forest they meet with outlaws, and Silvia is captured.

Happily, when Valentine had been banished from Milan he too had fallen in with these very outlaws, who spared his life on his promising to become their leader, as they would be honoured by having a nobleman for their chief. So Silvia had fallen into the hands of her own true love!

Her escape from Milan led to the Duke and the others following in pursuit, Julia going with the party as page to Proteus; and they too were attacked by the outlaws, the Duke and Thurio being captured and brought before Valentine. There they saw Silvia, and the foolish Thurio exclaimed: "Yonder is Silvia, and Silvia's mine." But Valentine dared him but to breathe her name, and the cowardly Thurio, seeing the bold lover angry, and knowing his own life was in danger, forthwith changed his tune.

The Duke, admiring the boldness of Valentine as greatly as he detected the cowardliness of Thurio, was at once won over to his daughter's side, and gave her to Valentine, who took the opportunity of securing a free pardon for his fellow outlaws, while Julia had meanwhile disclosed to Proteus how her love for him had brought her after him from Verona, and he was once more at her feet.

So the return to Milan meant happiness for all; even for the foolish Thurio, for if he had lost the Duke's daughter he had saved his own cowardly neck, which he valued more highly.

THE COMEDY OF ERRORS

THERE was a rich merchant of Syracuse, named Aegeon, who had twin boys, and these he christened with the one name Antipholus. It so happened that at the same place there were two other twin boys, whose mother was very poor, and Aegeon conceived the idea of buying these poor children, who had both

been named Dromio, to bring them up as servants to his own twins. But when returning to his home by sea a great storm arose, and the merchant himself, together with one of his own children and one of the Dromios, was rescued and taken to Syracuse, while, unknown to him, his wife, Aemilia, and the other two children were

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rescued and taken to Ephesus, Aemilia, however, being separated from the children.

Time went past, and the twin children grew to manhood without ever hearing of each other. When Antipholus of Syracuse and his attendant Dromio were nearly twenty years of age, they set out to search for their brothers, but Aegeon, thinking the searchers lost as they had not returned after some years, himself went forth to seek for them. At length Aegeon, his money all spent, found himself in Ephesus, where, admitting that he was a merchant of Syracuse, he was thrown into prison by the Duke of Ephesus, because the Duke of Syracuse had recently killed a merchant of Ephesus who had been unable to ransom himself.

Now, we must know that the son whom Aegeon had lost in the shipwreck, together with the other Dromio, had lived all this time in the town of Ephesus, while Aegeon's wife, Aemilia, had become the head of a priory. Antipholus of Ephesus was a favourite of the Duke. We can therefore see how the errors would begin when Antipholus of Syracuse, of whom Aegeon was in search, together with his particular Dromio, also arrived in Ephesus. As Antipholus of Ephesus had married a charming lady of that town, and his Dromio had married also, while both their brothers were still unmarried and knew nothing of each other, the newcomers to Ephesus had not been there long before everything was in a muddle. The one Antipholus mistook the other's Dromio for his own servant. Dromio of Ephesus mistook Antipholus of Syracuse for his master; while Antipholus was mistaken by his brother's wife for her own husband. And so on, until none of them knew whether he stood on his head or his heels.

Out of the last "error" came the explanation which put all things straight again. For Antipholus of, Syracuse, naturally denying to Adriana, the wife of his brother, that he was her husband, and behaving so strangely (as she thought) had to take refuge from her and her friends, who would have had him bound as a madman, by running into the priory of which, unknown to him, his own mother was the prioress.

Adriana appealed to the Duke, who was passing the priory at the time, and he was asking for an explanation, when her own husband and his attendant came up to complain of a jeweller who was charging him for a debt which he had not incurred, the debtor really being the Antipholus who was inside the priory.

At this very moment Aegeon, too, was being taken round the town as a prisoner held at ransom, and when he saw Antipholus and Dromio of Ephesus he thought they were the son and attendant of whom he was in search, though they, of course, denied all knowledge of him; but when Aemilia herself appeared she asked the aged prisoner if he was indeed the father of the twins named Antipholus. This he acknowledged, and she then told him that she was their mother and his wife, but, being parted from the children by some fishermen of Corinth after they were rescued, and believing herself alone in the world, she had entered this priory, of which she was now the head.

The tangle was soon made straight after this explanation; old Aegeon was released, and the family united after so many years and so many "errors." The bond of friendship, too, was strengthened when Antipholus of Syracuse became the husband of Luciana, sister of Adriana.

THE MERCHANT OF VENICE

ANTONIO was the name of a very rich and generous man who lived in Venice long ago, and whose merchandise many ships carried over the seas to distant lands. Though Antonio was so rich his greatest friend, Bassanio, was so poor that he once said of himself, "All the wealth I have runs in my veins," meaning that he was a gentleman, but lacked worldly possessions.

Now, this Bassanio loved very deeply a lady, both beautiful and rich, named Portia, who lived in a distant place called Belmont, and, when once he desired to

visit her, he confessed to Antonio that he could not go there for lack of money. On hearing this, Antonio, ever ready to help a friend, began to arrange for Bassanio to get the necessary gold.

Unfortunately at that time Antonio's ships were all at sea, so that his wealth was on the waters, and for that reason he had no ready money. At length he determined to borrow from an old Jew, who was a regular money-lender. Shylock was his name, and he hated Antonio because that kind merchant would always lend his money without charging interest,

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thus injuring Shylock's trade. He also knew that Antonio despised him ; and, above all, he disliked Antonio because he was a Christian. So when his enemy, as he regarded Antonio, came to borrow money from him, thoughts of revenge passed through the Jew's mind.

THE STRANGE AND TERRIBLE BARGAIN THE JEW MADE WITH ANTONIO

If only Antonio's ships were wrecked, or if pirates would steal from them, Antonio would not be able to repay the loan, said Shylock. But the cunning Jew pretended to make a bargain in jest, and offered to lend the money on condition that Antonio repaid it in three month's time, or else forfeited a pound of his own flesh ! Antonio did not doubt that his ships would return in time, so agreed cheerfully to this strange bargain, and got the money which enabled Bassanio, accompanied by his friend Gratiano, to go on his visit to Portia, the rich heiress.

It was known that when Portia's father was dying he gave her three caskets—one of gold, one of silver, and one of lead. On each of these was an inscription. "Who chooseth me shall gain what many men desire," was written on the gold one ; "Who chooseth me shall get as much as he deserves," on the silver one ; and on the lead one were the words, "Who chooseth me must give and hazard all he hath." Inside one of these caskets was a portrait of Portia, and whichever one of the men who professed to love her should choose that casket was to wed her.

THE WORDS OF MOCKERY WHICH GREETED THE FOOLISH SUITOR

Various suitors came to try their fortune in this strange lottery of love, and those who were conceited chose the gold or silver caskets. The suitor who chose the golden casket was mocked with these ominous words :

All that glisters is not gold ;
Often have you heard that told :
Many a man his life hath sold
But my outside to behold :
Gilded tombs do worms infold.
Had you been as wise as bold,
Young in limbs, in judgment old,
Your answer had not been inscrolled :
Fare you well : your suit is cold.

But now came Bassanio, whom Portia really loved, and she and her maid Nerissa trembled as he made the fateful choice, and this dainty song was heard :

Tell me where is fancy bred,
Or in the heart or in the head ?
How begot, how nourished ?
Reply, reply.

It is engendered in the eyes,
With gazing fed ; and fancy dies
In the cradle where it lies.

Let us all ring fancy's knell :
I'll begin it—Ding, dong, bell.

But of course he chooses the leaden casket which contains the portrait.

In the midst of all their joy at this happy choice Bassanio receives a letter from Antonio, who says that all his ships are lost, and Shylock is demanding his pound of flesh ; but adds that he would gladly die for his friend if Bassanio were only there to bid him farewell.

Bassanio told his lady the unhappy story, and she bade him haste away to be with his friend ; but as soon as he had gone she sent to her cousin, a famous lawyer, Doctor Bellario, to borrow his robes, and with these for herself, and the dress of a lawyer's clerk, which she had borrowed for Nerissa, Portia and her maid set out for Venice.

THE WISDOM OF PORTIA IN HER GREAT DEFENCE OF ANTONIO

Assembled in the Court of Justice there were all those interested in the strange case—Antonio, Bassanio, Shylock, Gratiano, the Duke of Venice, and many others—when Nerissa, dressed as a lawyer's clerk, entered and read a letter from Doctor Bellario, in which he wrote that he was ill ; but his young friend, Doctor Balthazar, from Rome, would defend the case ably, and that he had never known "so young a body with so old a head." Thus was Portia, disguised as a lawyer, announced.

Now, Portia was as wise as she was beautiful, and in her speech she first of all raised the hopes of Shylock until he praised her for "a Daniel come to judgment." He was entitled to the pound of Antonio's flesh, she argued. But she made two conditions—first, he must take exactly one pound in weight, not the weight of a hair more or less ; and secondly, he must not take one drop of blood, as that was not mentioned in the bond.

Of course, these conditions were impossible, and Shylock, now seeing where his blind hatred of "the fool that lent out money gratis" had led him, was willing to leave the court without his

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money, for to take his bond would have led to his being condemned to death himself. But Portia would not let him go so easily. She stayed him, saying:

"There is a law whereby, if any foreigner in Venice shall scheme against the life of a citizen, his money shall be forfeited, half of it going to the State, the other half to his intended victim, and his own life will rest with the mercy of the Duke."

Thus Shylock lost his bond and might have lost his life; but that was spared on condition that he willed his fortune to his own daughter, Jessica, whom he had ill-treated, and to her lover Lorenzo, and also that he renounced his old religion and became a Christian. In his delight at the happy issue of events

Bassanio offered the pretended doctor of laws anything he might ask; but, to his dismay, a ring which Portia had given him on his departure from Belmont was required of him. The lawyer's clerk also demanded Gratiano's ring, which Nerissa had given to him.

When Bassanio returned to Belmont, bringing with him Antonio to see Portia, she and Nerissa asked for their rings, which neither of the men could produce. After pretending to be very angry with their lovers, Portia and Nerissa showed the rings on their own fingers. Antonio then knew whose wise speech had saved his life, and his joy was complete when Portia gave him a letter in which it was stated that three of his ships, which were thought to be lost, had safely come to port.

ALL'S WELL THAT ENDS WELL

BERTRAM, the young Count of Rousillon, in the south of France, bade farewell to his widowed mother before he left their castle for the Court of the King at Paris. His mother was not alone in her sorrow over his departure, for no sooner had he gone than Helena, a lady whom the Countess had brought up as if she had been her own daughter, was overwhelmed with grief. She mourned because she loved Bertram, yet dared not let it be known, as she, the daughter of a physician, though a famous one, could not hope to marry a nobleman of the Royal blood of France.

In the midst of her grief a daring idea came to Helena's mind. The King of France was then so ill that all his learned men despaired of his life. He was suffering from a disease which her dead father had been able to cure, and the remedy for which Helena knew. "Why," thought she, "should I not also go to the Court of the King?" Her thoughts she spoke aloud, thinking herself alone; but she was overheard by a servant, who told the Countess.

Instead of being angry, the Countess told her that she had discovered the real cause of her tears, and even said she would welcome Helena as her daughter-in-law, promising to aid her in her mission.

When, in due time, Helena came before the ailing King, he was unwilling to allow her to try to cure his disease; but she persisted, saying that if she failed she was willing to suffer any punishment. As her reward on his recovery, she demanded that he should give her a nobleman of the

Royal blood of France as her husband, to be chosen by herself. To this he agreed.

After the King recovered he called together a number of his courtiers, explained the terms he had arranged with the fair physician, adding that he would give her wealth and raise her rank in gratitude for having cured his disease. When Helena went forward to Bertram and signified him as her choice, the young Count hotly refused thus to be forced into marriage; but his sense of loyalty overruled his pride, and he at length agreed to marry Helena. No sooner was the ceremony over, however, than he arranged secretly to go to the wars in Tuscany, and leave his unsought bride.

Poor Helena, the unconscious messenger of evil tidings, brought back to the Countess at Rousillon a letter from her son, in which he vowed never to return. He also told Helena he would never see her again until she had obtained a ring which he wore constantly on his finger.

Helena, gentle and timid in most things, was not to be repulsed in this disdainful fashion; so, dressed as a pilgrim, she set out for Florence, in the country of the wars.

In Florence there lived a widow and her daughter Diana. Often had Bertram told Diana of his love for her, though she had always refused to listen; he even wished her to promise to be his wife when Helena would die. But Helena, unknown to Bertram, had come to stay in Florence with this widow and her daughter, nor did she ask for their help in vain. Diana now showed more friendliness to Bertram, and

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begged him to give her his ring, saying she would give him one in return.

In the darkness of the night, at the appointed place, without saying a single word, according to the agreement, rings were exchanged between Bertram and, not Diana, as he supposed, but Helena, whom he could not see.

Meanwhile, in France it had been given out that Helena was dead, as she had disappeared from Rousillon, and in Bertram's absence it was arranged that he should marry for the second time, but to a bride of nobler birth. Bertram, however, discovered a sudden love for the wife he supposed lost, and on returning to his ancestral castle he refused to marry again.

The widow from Florence came to Rousillon, where the King was on a visit, and with her were Diana and Helena, both disguised.

Diana told a strange story to the King, and when all were completely mystified by Diana declaring that the ring had been given to her, yet not to her; that Bertram had met her at midnight, yet that it was not she; the riddle was unsolved by bringing forward Bertram's still living wife, who had actually got the ring from him, and for whom the erring Count had now conceived a real affection.

So Helena and Bertram were, after many trials and misunderstandings, happily united, and "all's well that ends well."

THE TAMING OF THE SHREW

A SHREW is a woman whose temper is fiery; who is never satisfied with things as they are; nagging, peevish, always finding fault.

We are to suppose, then, that Katharina, the elder daughter of Baptista, a rich gentleman of Padua in Italy, was so ill-tempered that she could be described as a shrew. Perhaps at heart she was neither selfish nor ill-feeling; but possibly, being spoiled by her parents as a child, she had grown into these unfortunate habits, which made her so unpleasant a companion that there seemed little likelihood of anyone marrying her, though it was known that she would some day receive great wealth from her father.

Quite the opposite to Katharina was her younger sister Bianca. Charming in appearance, gentle and winsome in character, and beloved by all, we may be sure there was no lack of gallant gentlemen who would willingly have married Bianca. To some of her suitors Baptista announced that he would not allow Bianca to be married until her elder sister had found a husband. In the meantime he intended that the young ladies should have the best possible teaching in the accomplishments of the time, and asked that any good tutors might be recommended to him.

At this time there had come to Padua, famous for its colleges, a young gentleman of Pisa named Lucentio, son of a rich noble of that town. His purpose in Padua was to study, but he had no sooner set eyes on Bianca than he fell in love with her, and thoughts of study were soon dismissed.

On learning that Baptista wished to engage tutors for his daughters, Lucentio

planned with one of his own servants, Tranio, that he should impersonate him as a rich gentleman come to Padua to pay court to Bianca, while he himself would contrive to be engaged as tutor to the two ladies. It was so arranged, and before long Bianca was in love with her handsome and agreeable instructor.

But in the meantime one of Bianca's other suitors, a gentleman named Hortensio, had enlisted the aid of a merry friend from Verona, who undertook no less a task than to marry Katharina, and thus leave Bianca free to marry Hortensio. This was Petruchio, who was at once clever, masterful, high-spirited.

Petruchio began his love-making to Katharina by addressing her as Kate, in order to annoy her; when she scolded he pretended to find her "passing gentle"; and, finally, when she struck him he promised her as good as he had got, assuring her that, whether she cared for him or not, he meant to marry her. When her father came on the scene, the dashing Petruchio calmly informed him that the wedding would take place next Sunday.

When Sunday came, and Petruchio arrived for the wedding, he presented an extraordinary figure, wearing a new hat, an old coat, shoes that were not neighbours, a rusty sword, and mounted on a horse so old and skinny that it was of no more value than the rubbishy harness it wore. His servant was no less strangely attired.

Baptista was thoroughly ashamed of the bridegroom, but Petruchio refused to change his clothes, as this was a part of his scheme for "taming the shrew."

ONE OF SHAKESPEARE'S MERRY MEN



TOUCHSTONE AND AUDREY IN THE FOREST OF ARDEN: A SCENE FROM AS YOU LIKE IT

In the church he behaved quite scandalously, insulting the priest, and kissing Katharina so loudly that the building echoed with the sound. Nor would he wait for the wedding feast, but set out at once with his wife for Verona.

Their journey was one series of misfortunes, and the bridegroom behaved as if he cared nothing for his bride. The last part of the way they had to walk, owing to their horses taking flight when Petruchio was thrashing his servant; and they arrived, footsore and weary, at his residence, where he made matters worse by complaining about everything, throwing the food on the floor and beating his attendants.

In this way Petruchio behaved for a time, and was always in so bad a temper that Katharina had no chance to show how bad her own temper was. Hortensio came to see them, and Petruchio decided they would return with him to Padua, promising that they should both go there dressed according to their rank. But when costumes for Katharina and himself were brought in to choose, he declared them all unsuitable, throwing them on the floor, and when at last they did set out he was still wearing his dress of odd clothes.

At Padua, meanwhile, Baptista had promised that Bianca would be wedded to

her richest suitor, and this was Tranio, who was playing the part of Lucentio, while the other pretended to be merely the teacher of Greek and Latin. Tranio arranged with an elderly man to impersonate the father of Lucentio, and got him to give his consent to the wedding, inviting Baptista to his house to arrange the matter, while Bianca was to follow with a servant.

Bianca did follow, but with the pretended tutor Lucentio, who took her to church on the way and married her. When Lucentio arrived at his own house at Padua, his real father from Pisa had just come to visit him, so that Lucentio was in time to kneel at his feet and ask at once his pardon and his blessing.

The journey of Petruchio and Katharina back to Padua was conducted in the strangest way, Petruchio insisting on his wife agreeing to his most ridiculous statements, and making her kiss him publicly in the street under threat that they would return to Verona if she were ashamed to do so.

Indeed, by the time they reached Lucentio's house there was no more obedient wife in all Italy. Katharina was actually so "tamed" that she even made a little speech to the other ladies present on the virtue of a wife's obedience.

MUCH ADO ABOUT NOTHING

WHEN returning from battle with some of his principal followers, Don Pedro, Prince of Arragon, an ancient kingdom of Spain, broke his journey at the town of Messina to rest for a time as the guest of its governor Leonato.

This Leonato had a daughter, as gentle and good as she was beautiful and clever. Her name was Hero, and she and her cousin Beatrice, who was witty and merry, more lively, but not quite so even-tempered as Hero, made the home of Leonato bright and happy. It so happened that in the train of Don Pedro there was a young and brave gentleman of Florence, named Claudio, a great favourite of the Prince, because of the soldierly service he had rendered him.

Claudio was very happy in going to Messina, as he was in love with Hero, whom he had seen before, and he now rejoiced that the Prince had promised to advance his suit.

There was another gentleman of the Prince's train, named Benedick, a young

nobleman from Padua, who was also a favourite of Don Pedro's; and he too was brave and manly, but more moody than Claudio, sometimes liking to read a book rather than to make himself agreeable to the ladies. All went smoothly so far as Hero and Claudio were concerned, for not only was it clear they loved one another, but, Leonato having given his consent to their marriage, preparations for that happy event were soon in progress. Meanwhile, every time that Beatrice and Benedick had met they found occasion to quarrel, and, though they seemed to like each other's company, one might have thought, to hear them, that nothing would induce either to marry.

Now, when a couple are engaged to be married they are usually so happy that they like to see others happy also; and so it was with Hero and Claudio. Together with the Duke and Leonato, they agreed on a little plan to make Beatrice and Benedick cease their bickering and love each other.

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One day, when Benedick had withdrawn to a shady arbour in the garden, the Prince, Leonato, and Claudio seated themselves near to where he was and began to talk, so that Benedick might hear them in his arbour, about the way in which poor Beatrice was dying of love for him! They pretended that she was deeply in love with Benedick, and yet Hero had said: "Beatrice would die ere she made her love known."

This, you will see, was the beginning of their little scheme, and it is no wonder that Benedick, overhearing their remarks, began to think his behaviour to Beatrice had been cruel and ungallant.

Meanwhile, Hero had her part to play in this pretty comedy of love, and, sending one of her attendants to tell the unsuspecting Beatrice that Hero and another lady in the garden were talking about her, it was not many minutes before that lively and inquisitive lady had stolen out to overhear what they might have to say. Their talk was all about Benedick being deeply in love with her. They also spoke in so much praise of him that Beatrice forthwith became as tender in her thoughts towards him as his had now become tender towards her.

But into this happy comedy the figure of a mischief-maker now steps. This is Don John, half-brother of the Prince, whom he hates so much that he would do anything to annoy him. For the moment he can think of nothing better than to stir up the feeling of jealousy between the Prince's young friend Claudio and the unsuspecting Hero. Assuring the lover that Hero had really given her heart to another gallant, and inducing both Claudio and Don Pedro to hide with him in the garden on the eve of Hero's intended wedding day, a lady was seen by them at Hero's window bidding farewell to an unknown man. This was merely one of Hero's lady companions saying good-night to her own sweetheart, a follower of

Don John, but Claudio and the Prince were both misled into thinking it was Hero herself.

Claudio, mad with rage, swore to renounce the innocent Hero at the altar next day. This cruel threat he actually fulfilled, and the poor lady, utterly at a loss to understand the cause, almost died of grief. Her cousin Beatrice, of course, would not believe her capable of any dishonourable action, and made Benedick, now really in love with herself, undertake to fight a duel with Claudio.

In the meantime it was pretended that Hero had really died; and Benedick had challenged Claudio to the duel, just when Dogberry and Verges, two comically stupid officers of the watch, brought in two of Don John's followers whom they had arrested at night, scheming of some plot, as they believed. To save himself, one of the prisoners at once confessed that he had visited his sweetheart that night, so that when she came to the window the watchers in the garden might mistake her for Hero. This he had done at the instigation of Don John.

Claudio, on hearing this, was overwhelmed with grief, and, believing the innocent lady to have died, he was in despair; but Leonato told him his brother had a daughter the very image of the child he had lost, and if Claudio would marry her he would forgive him the sorrow he had caused by his folly in listening to slanderous tongues.

When this new bride came to meet her bridegroom, her features were masked; but judge of Claudio's surprise when she uncovered her face, and he looked again into the dear eyes of Hero!

The threatened duel between Claudio and Benedick had now no excuse, for all were friends again; and not only do we see Hero and Claudio ready for their wedding, but Beatrice and Benedick also.

Don John was imprisoned; and in due time was punished for mischief-making.

AS YOU LIKE IT

THERE was a kind and peace-loving Duke against whom his brother Frederick successfully rebelled, usurping his dominions. Withdrawing into the great and wild Forest of Arden, this Duke, with a number of faithful followers, lived in his exile a happy and peaceful life.

One of his old friends had been Sir Rowland de Boys, who died, leaving

three sons, Oliver, Orlando, and Jaques. To the first-named, who was the eldest, he left all his money and estates, except one thousand crowns for Orlando. Oliver was charged to give his brothers a good upbringing, but, though he provided Jaques with ample schooling, he had a hatred of Orlando, whom he kept idly at home. As Orlando grew up, he could not

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endure his idle life, and at length demanded the money which his father had left him, so that he might leave his brother's house.

Oliver, wishing to keep the money, arranged with a great wrestler, who was a servant of Frederick, the usurper, to challenge Orlando to a match, believing his brother might be killed if he fought.

THE BEAUTIFUL ROSALIND LEAVES HER CRUEL UNCLE'S PALACE

The match was duly arranged, and among the spectators were Frederick's daughter Celia, and her fair cousin Rosalind, whom Frederick allowed to live at the palace, though she was the daughter of the exiled Duke, the two girls being inseparable friends. When Rosalind saw that so young a man was to fight the champion wrestler, she begged of him to refuse. Orlando, however, was not afraid; and, to the surprise of all, he overthrew the usurper's champion.

Frederick, who witnessed the combat, was about to congratulate the victor, when he heard that he was the son of his old enemy, and the praise on his lips changed to anger. But Rosalind, in admiration of Orlando's bravery, gave him a chain she was wearing. This action so annoyed Frederick that he now banished her from the palace. Perhaps he had been waiting for the excuse, as Rosalind was so beautiful in person, and so witty in mind, that his own daughter, Celia, though comely and pleasant, suffered by contrast with the bewitching daughter of the banished Duke.

Celia dearly loved her cousin Rosalind, and had not the least jealousy of her charms, so that when her companion was banished from the palace she did not hesitate to share her fate, and they went away together, taking with them the witty jester Touchstone, whose comic sayings would cheer them on their way.

ORLANDO SEEKS SANCTUARY IN THE FAMOUS FOREST OF ARDEN

They did not go, of course, in the rich dresses they wore in the palace. Rosalind, who was "more than common tall," dressed herself like a shepherd, while Celia put on the clothes of a shepherdess. Their destination was the Forest of Arden, where the banished Duke held his rustic court.

Now, when Orlando was returning to the house of his brother he was met by an old servant of the family named Adam, who loved the youth so much that, knowing Oliver meant to kill him, he had brought all

the savings of his life, some five hundred crowns, and urged Orlando to go away with him. They, too, set out for the safe seclusion of the famous forest.

Rosalind and Celia in due time gained the shelter of the forest, where at length they found a lodging in a little cottage; but what perplexed them greatly was to discover little verses written on paper and placed in the trunks of trees, expressing great love for Rosalind. Who could the unknown rhymers be? Celia undertook to find out, and traced him at length to Orlando, whom Rosalind, still pretending to be a man, promised to cure of his love if he would come each day and make love to her in the name of Rosalind.

A friend of the Duke, another Jaques, is used to infuse grave thought into the play, as a contrast to its holiday feeling in the forest. He it is who reminds his companions of the drama played in each of their lives, from childhood to old age.

THE SEVEN AGES OF MAN AS SHAKESPEARE DESCRIBED THEM

All the world's a stage,
And all the men and women merely players :
They have their exits, and their entrances ;
And one man in his time plays many parts,
His acts being seven ages. At first, the infant,
Mewling and puking in the nurse's arms.
And then the whining schoolboy, with his satchel,
And shining morning face, creeping like snail
Unwillingly to school. And then the lover,
Sighing like furnace, with a woful ballad
Made to his mistress' eyebrow. Then a soldier,
Full of strange oaths, and bearded like the pard,
Jealous in honour, sudden and quick in quarrel,
Seeking the bubble reputation
Even in the cannon's mouth. And then the
justice,

In fair round belly with good capon lined,
With eyes severe, and beard of formal cut,
Full of wise saws and modern instances ;
And so he plays his part. The sixth age shifts
Into the lean and slippered pantaloon,
With spectacles on nose, and pouch on side,
His youthful hose well saved, a world too wide
For his shrunk shank ; and his big manly voice,
Turning again toward childish treble, pipes
And whistles in his sound. Last scene of all,
That ends his strange, eventful history,
Is second childishness, and mere oblivion,
Sans teeth, sans eyes, sans taste, sans everything.

The flight of the two ladies from the palace had led Frederick, the usurper, to accuse Oliver of sheltering them and

SHAKESPEARE'S COMEDIES

Orlando, little knowing how Oliver had tried to rid himself of his younger brother. So Oliver too was banished from court, and, in common with the other exiles, made for the forest, where he would have been killed by a lion had not Orlando rescued him at the cost of injury to himself.

This noble action so shamed Oliver that he took his brother to his heart; and since Orlando, being injured, could not visit Rosalind's cottage as usual, Oliver went there to explain his absence, and, seeing Celia dressed as a shepherdess, fell in love with her forthwith.

It was arranged that the wedding of Oliver and Celia should take place at the duke's encampment, and as Orlando protested that he still loved the lady who gave

him the chain, Rosalind promised she would bring her to him at the wedding of Celia; which she did, of course, by putting off her disguise and appearing there as her own delightful self, not only to the joy of Orlando, but also of her father the Duke.

Oliver was now so happy that he promised to give Orlando his estates; but presently news came that Frederick himself was on the way to kill his brother, the banished Duke. By a strange chance, however, he met a good old man who spoke to him of the evil life he was leading, and so changed his mind that he determined for the future to give his thoughts to religion, and surrendered to the Duke the dominions which he had unlawfully usurped. Thus happiness was restored to all.

TWELFTH NIGHT; OR WHAT YOU WILL

FANCY Shakespeare at a loss for a title! It seems absurd that one whose mind was so full of fancies, so rich in thoughts, should ever have been at a loss for a title for a play he had written. Yet such was the case with the comedy which we know as *Twelfth Night*; or, *What You Will*. It is said to have been christened *Twelfth Night* for no better reason than that it was first performed on January 6, which was observed as a festival in Shakespeare's day, and long afterwards, being the twelfth day after Christmas.

Illyria was the name of a country on the Adriatic Sea, and, while sailing thither, the twin son and daughter of a gentleman of Messaline were wrecked. The youth's name was Sebastian, his sister was called Viola.

Both of them had the good fortune to escape from drowning during the shipwreck, but they did not reach the land together, and each was ignorant of the other's fate. Viola was saved by a sea captain, by whose help she contrived to dress up as a page, and made her way to the court of Orsino, Duke of Illyria. It was safer for her to assume this disguise than to travel as an unprotected girl in a strange land, and she had no difficulty in getting accepted as a page to the Duke, for she looked a handsome boy!

Now, the Duke was in love with a young and rich lady of his land, the Countess Olivia, and wished to marry her. But Olivia had rejected his proposals, refused to see him, and even spoke of shutting herself up for seven

years to mourn for a dead brother. The Duke thought that his handsome young page would be a good messenger to send to Olivia on his behalf, and so Viola was sent by Orsino to plead with the fair countess on behalf of her princely lover. But, greatly to Viola's embarrassment, instead of softening Olivia's heart towards the Duke, the messenger had spoken so sweetly that Olivia fell in love with the pretty page.

A new and unpleasant actor now came upon the scene, in the person of a drunken old courtier named Sir Andrew Aguecheek, who had the audacity to consider himself a rival for the hand of Olivia. This Sir Andrew, noticing that the Countess was so favourably disposed to the engaging young attendant of the Duke, challenged Viola to a duel.

Viola's disguise had thus brought her into a strange adventure, and she had no idea what the issue would be. But three months had now passed since the shipwreck, and her brother Sebastian, in company with his friend Antonio, who was so devoted to the young gentleman that he had even given him all his money, was on his way to the palace of Orsino. Antonio, having been at the time in arms against the Duke, was afraid to accompany Sebastian to the palace, and thus their ways had to separate, to their mutual sorrow.

Soon after leaving his friend, Antonio was surprised to come upon two persons about to engage in a duel, and thinking the younger of them to be none other than Sebastian, he promptly interfered

LITERATURE

on his behalf. The duellists, however, as we may guess, were Sir Andrew and Viola, the notorious old coward having forced the young page to draw her sword, much against her will, just at the moment of Antonio's timely arrival. The immediate result of Antonio's interference was not only to stop the fight, but to bring some of the followers of the Duke on the scene, and they, recognising him as a former enemy, put him under arrest. Hereupon he turned to Viola, and asked her—thinking her Sebastian—to give him back some of his money, knowing he might have need of that; but Viola showed her natural astonishment at this request, and protested she had never seen him before.

While Viola's adventures are thus increasing, Sebastian too is having his share of misunderstanding, for Sir Andrew Aguecheek, baulked of his revenge on the timid page, comes upon Sebastian in front of Olivia's house, and mistaking him for Viola, draws his sword upon the youth; but the coward has soon excellent cause to regret having forced the youth to fight. The Countess, having witnessed what she supposes to be the manly conduct of the Duke's page in the encounter with Sir Andrew, is more than ever charmed with him, and, inviting Sebastian into her house, frankly declares her love for him, and her willingness to marry him.

Here is, indeed, the strangest of Sebastian's adventures; but as the lady is young and lovely he accepts the situation gallantly, and a priest being at hand the wedding ceremony is not delayed. Olivia is in entire surrender; she no longer dreams of seven years of mourning for the dead! The next scene in this queer comedy

of errors takes us to the audience chamber of the Duke, whither Antonio has been brought by his captors before Orsino. There Antonio, seeing Viola with the Duke, and still mistaking her for her twin brother, chides her for the way in which she has repaid his constant friendship of the past three months.

The Duke, of course, was mystified by Antonio's words, as Viola had acted as his page for three months; but confusion became worse confounded when Olivia arrived, and, seeing Viola there, addressed her as "husband." The Duke was enraged that his attendant should, as he now thought, have betrayed his trust and made love to the lady, nor were matters improved when Viola denied Olivia's statement that they were married, and the priest who performed the ceremony was called to bear witness to it! Sir Andrew Aguecheek added a further touch to the confusion by appearing and stating that the Duke's page had but recently in a quarrel broken his head, and that of his boon companion, Sir Toby Belch, Olivia's uncle, for whom he sought the services of a surgeon.

When matters were thus at their worst, all was suddenly made clear by the appearance of Sebastian himself, who, after explanations, discovered that the Duke's page was none other than his own sister, whom he had never hoped to see again, believing her to be drowned. As Sebastian had so quickly become the husband of Olivia, who, while refusing to become the wife of the Duke, was nothing loth to be his "sister," Orsino chose the true romantic ending for this comedy of the twins by offering his hand to Viola.

MEASURE FOR MEASURE

IN olden times there was a Duke of Vienna whose good-natured treatment of his people had not been to the advantage of his State. The laws of the city not being strictly enforced, as all laws should be, people stood in no fear of them. The Duke saw that for his people's good the laws would have to be kept, but at the same time he did not wish to appear suddenly to change from a kind ruler into a tyrant. He had, therefore, to think of some way to carry out his reform without appearing to have lost his kindly interest in his subjects.

Among the noblemen of Vienna was one Angelo, a stern, severe, and cold-

hearted man. The Duke, thinking that Angelo would be just the man to enforce the laws, appointed him Lord Deputy, and gave out a report that he himself was leaving for a time to visit another country. Instead of going away, however, he assumed the habit of a monk, and, thus disguised, remained in Vienna to see how Angelo conducted himself.

As chance would have it, the first case to call for Angelo's judgment was that of Claudio, a young gentleman who had secretly married a young lady named Juliet. In those days, and still in many parts of Europe, a bride had to bring her husband a marriage dower,

SHAKESPEARE'S COMEDIES

a gift of money or land, presented by her parents or relatives. Claudio and Juliet were keeping their marriage secret until it was known what fortune her relatives would fix for her dower. For this Claudio was condemned to death, a sentence which was an outrage, but Angelo was keen to exercise his new power, like all persons "drest in a little brief authority."

Claudio had a sister who, when this misfortune befell her brother, had but newly entered a convent, and on news of the impending execution of her brother reaching her, retiring and gentle though she was, she took courage to go forth and intercede with Angelo on behalf of Claudio.

Although the Lord Deputy was a cold and cruel man, he was not insensible to the winning beauty of Isabella, as Claudio's sister was named, and her appeal seemed to soften him; but that was only because a selfish desire to possess the beautiful creature had been awakened in him. If she would consent to marry him, he promised to pardon her brother, thus ready to add one injustice to another. The idea was horrible to a young lady who had just given up the thought of marriage, and of all men Angelo would have been the last she could have cared for. So she indignantly refused him, and when she visited her brother in prison, he too approved of her refusal; but, as he thought the more of his impending doom, his courage failed him, and he begged her to submit for his sake.

The talk between the brother and sister in the prison had been overheard by a supposed friar, who was none other than the Duke in disguise, and he was filled with anger to find that Angelo was abusing his trust. In a flash he thought of a clever way to outwit Angelo and bring happiness where so much sorrow threatened.

There was a lady, he told Isabella, named Mariana, whom Angelo, five years before, had vowed to marry, but did not

do so, as her marriage dower was not forthcoming; yet Mariana loved him still. Isabella was to make pretence of agreeing to Angelo's proposals for the sake of her brother, but she had to arrange with this Mariana that she would take Isabella's place at the wedding, wearing a veil, so that the bridegroom would not discover the ruse till too late. Mariana was also to say to Angelo when she came before him veiled: "Remember now my brother."

All this was carried out accordingly; but a pirate having died in prison, whose hair and beard resembled those of Claudio, the Duke managed to get the head of this dead man sent to Angelo with the intimation that it was the head of Claudio! Meanwhile Claudio himself had been, thanks to the Duke, taken out of danger.

Now was the moment for the Duke to complete the discomfiture of his unfaithful deputy; so, withdrawing from the city, and dressing again in his proper clothes, he sent forward news that he was returning from Poland.

Angelo came to the city gate to meet him, and the usual friendly speeches were made, the Duke appearing ignorant of all that had happened. Then came forward Isabella, pretending to appeal to the Duke to punish Angelo for having murdered her brother. Angelo was indeed dismayed when the veiled lady he had but newly wedded also came forward and disclosed herself as his old sweetheart.

The Duke threatened to visit upon Angelo the fate which had been designed for Claudio; but both Isabella and Mariana begged that he might be pardoned, and this the Duke agreed to. Nor did Isabella refuse the offer of the kind-hearted Duke to make her his own wife. And so the comedy ended with happiness for all. We can see why it is called *Measure for Measure*, as Angelo was made to feel himself in much the same position as that in which he had placed Claudio.

THE COMEDY OF THE WINTER'S TALE

THERE were two Kings who had been brought up together and grown to like each other so well that they were almost as brothers. The one was King of Sicilia, his name being Leontes; and the other, who was called Polixenes, reigned over the kingdom of Bohemia.

Once when Polixenes was on a visit to Leontes, Leontes had so enjoyed his society that he begged his friend to

stay longer. But Polixenes seemed bent on returning to Bohemia, until Hermione, the tender and loving Queen of Leontes, joined her entreaties to those of her husband, when Polixenes yielded to her gentle persuasion and decided to prolong his visit.

Unhappily, Leontes, though in the main a good and kind King, must have been of a jealous nature, for though he

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had asked his wife to urge Polixenes to stay, when his old friend did, for her asking, what he had not seemed ready to do for him, Leontes suddenly became foolishly jealous. In his folly he told his servant Camillo that he believed Polixenes and Hermione had fallen in love; but Camillo knew this was not true. He humoured the jealous King, however, by promising to poison Polixenes if what Leontes said was true. But what he did was to tell the King of Bohemia of the madness that had afflicted his old friend, and that night both Polixenes and Camillo fled from Sicilia.

THE JEALOUSY THAT BROUGHT LEONTES TO THE DEPTHS OF DESPAIR

Nothing would persuade Leontes of his folly, and he accused his poor Queen of acts and thoughts of which she was entirely innocent. He even refused to look on their newly-born daughter Perdita, and ordered that the child should be taken and left to die in a desert place.

Naturally Hermione denied the unjust charges brought against her, and in this she was supported by the famous oracle at Delphi. This oracle was supposed to be the voice of the gods, which in pagan times could be consulted on matters of difficulty through the priestess in the great temple of Delphi. It was, of course, entirely superstition; but the answer that came from Delphi as to Hermione's conduct said she was entirely innocent, whereas Leontes was a jealous tyrant, who would not have an heir "if that which is lost be not found."

Soon the words of the oracle seemed to be coming true, as the King's only son, the young Prince Mamillius, died of grief at his mother's woes; and Hermione herself became so ill that it was openly declared she too had died.

Too late, the jealous king realised his folly; and now that he believed both his wife and son to be dead, he declared he would visit their grave each day and spend his years in mourning.

THE KINDLY SHEPHERD WHO RESCUED THE LITTLE PRINCESS

But Leontes did not know that, while the officer who had taken little Perdita to a desert part of Bohemia had himself been killed by a bear, the child had been rescued by a shepherd, who knew from certain jewels and other things the officer had with him that the child was of royal birth. Still, the shepherd took no steps

to find out the parents, but brought her up as his own daughter, and watched her with joy and delight as she grew into the loveliest shepherdess that ever was.

Sixteen years thus passed by, and Perdita found herself beloved by a brave and handsome youth, who often came to visit her as she tended her sheep; but whence he came she did not know.

After all these years, too, Camillo, who had lived with Polixenes since they fled from Sicilia together, had a great longing to return to his native country. But the King of Bohemia was loth to let him go, as he wished that they should go together in disguise to discover why the young Prince Florizel was so often absent from Court and loved to spend his time in the quiet of the country.

This Camillo agreed to, and their discovery was indeed a surprise to the King, for Florizel proved to be none other than the sweetheart of Perdita, the shepherdess, whom he wished to marry. The King, of course, sternly forbade him, and threatened to have Perdita removed if she ever saw Florizel again. But Camillo now carried out his wish to return to his native land, and took with him, in disguise, both Florizel and the lovely shepherdess.

THE HAPPY ENDING OF YEARS OF SORROW FOR LEONTES

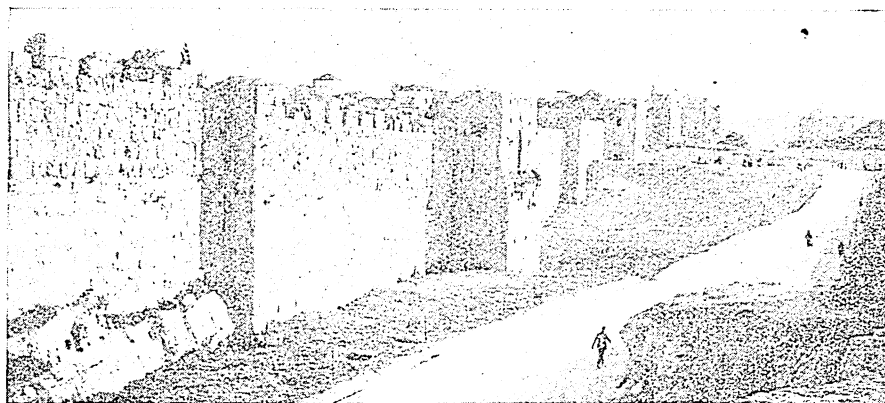
Leontes gave a warm welcome to the son of his old friend, whom he had so greatly wronged; and the old shepherd, having followed the runaways into Sicilia, disclosed the parentage of Perdita, to the joy of her father.

Then came the happiest event of all, when Paulina, a dear friend of Hermione, and widow of the officer who had taken Perdita away, invited Leontes to see a beautiful new statue of Hermione. When he did see it, so lifelike it seemed that he could scarce forbear to touch it; and lo! the figure descended from the pedestal and laid her head on his breast. It was Hermione, for she had never been dead!

Leontes, now happier than his folly gave him any right to be, was friends again with Polixenes; and, of course, Florizel and Perdita were married in due course, thus uniting the fortunes of the two kingdoms.

And so ends *The Winter's Tale* on a note of good fortune. The tangled skein is straightened out, and the course of true love gives promise of henceforth running smooth.

The Story of the Most Beautiful Book in the World



The road to Jerusalem along which Paul went to meet Peter

PAUL AND PETER MEET

IF we think of the proud place that Saul of Tarsus had occupied in Jerusalem we shall be able to understand the feelings of Paul the Apostle as he drew near the Holy City, footsore and weary, after the long journey from Damascus.

Of all the Jews in that sacred city he had been the most zealous for the Law. Famous for his learning, marked out for the highest honours by his passionate energies, a man stamped with the seal of power and dominion, he had exercised a unique spell upon the multitude of Jews, both in the temple and in the street.

He had been, perhaps, the most famous Jew in Jerusalem. His friendships were among the proud and powerful Pharisees. His fame was the fame of a master man, a leader, a ruler of the most shining and distinguished qualities. And now he was returning on foot, as an outlaw, a friendless, homeless, penniless wanderer on the earth—worse than this, as a traitor.

But one great aspiration upheld him in this difficult hour. Hidden away in some mean house in one of the poor back streets of the city was a Galilean fisherman who had lived with Jesus, who had heard his voice, looked into his eyes, broken bread with him, sat with him on the Mount of Olives, and asked him concerning the kingdom of heaven.

To reach this Galilean fisherman was now the desire of the once proud Pharisee. His intense and bitter loneliness could only be supported by the company of one who had known Jesus, who could tell him all he desired to know about that wondrous revelation of High God. And so, through the humiliation and bitterness of his return, Paul felt the joy that was before him, and hastened his steps towards the city in which Peter lived.

It seems that he met with Barnabas, a friend of his, one who had known him in the past, who believed in him, and knew the story of his conversion. By this good and excellent man, destined to be the companion of his life, Paul was led to the house where Peter the fisherman lodged.

We could well sacrifice some of the chief books in the world for a single chapter describing to us the meeting of Peter and Paul. No meeting could be more dramatic.

The characters of the two men seize our imagination. Peter was the most impulsive and headstrong of Christ's followers; Christ had upbraided him on one occasion with a swift rebuke, and on another occasion had warned him that he would deny his Master; yet all through had shown him a love and confidence which lifted him above the heads of the other disciples.

Paul, for his part, was equally impetuous, headstrong, and reckless; but his impetuosity was of the intellect, not of the heart. He was the impulsive zealot of the Law, with a quick brain for argument, a fierce and haughty contempt for the loose ideas of ignorant men.

These two men, the provincial and unlearned fisherman and the brilliant and accomplished Pharisee, came face to face in a house in Jerusalem, long ago forgotten, and for fifteen days discussed the character and the works of Jesus of Nazareth.

THE FIFTEEN DAYS PAUL SPENT IN JERUSALEM WITH PETER

"After three years," says Paul, "I went up to Jerusalem to see Peter, and abode with him fifteen days. But other of the apostles saw I none, save James, the Lord's brother." That is all we know of this great interview.

But we have another glimpse of Paul's general reception at Jerusalem. However kind may have been the greeting of the warm-hearted, noble-natured Peter, from the rest of the Nazarenes at Jerusalem Paul received the coldest welcome. "They were all afraid of him, and believed not that he was a disciple."

He was met on every side (says Dean Farrar) by cold, distrustful looks. At one stroke he had lost all his old friends; it seemed to be too likely that he would gain no new ones in their place. The brethren regarded him with terror and mistrust; they did not believe that he was a disciple at all. The *facts* which accompanied his conversion they may, indeed, have heard of; but they had occurred three years before.

The news of his recent preaching and recent peril in Damascus was not likely to have reached them; but, even if it had, it would have seemed so strange that they might be pardoned for looking with doubt on the persecutor turned brother—for even fearing that the asserted conversion might be only a ruse to learn their secrets, and so entrap them to their final ruin.

PAUL'S VISION OF THE LIGHT OF THE WORLD THAT WAS TO COVER THE EARTH

But Paul, however hurt he might be by this cold distrust of the brotherhood, was at least exalted by what Peter had to tell him. Everything the simple fisherman said became charged with spiritual meaning to the greater soul of this greatest of men. He listened to Peter's narrative, questioned and cross-examined, fastened the whole story into his heart, and at the end of those fifteen days rose up and went

boldly out to preach Jesus to the Jews and to the Greeks.

And now once more we see the same tragedy that we witnessed at Damascus. As the Gadarenes implored Jesus to depart from their coasts, so the timid Nazarenes in Jerusalem begged Paul to go from them, lest his bold preaching should bring ruin on the brotherhood. There is no question that Peter and the rest of the apostles conceived of Christ's Church—not then called a Church, and by Peter himself never called a Church to the end of his days—as something existing for a very few, to which other people should be wooed in secret even if they were to be wooed at all.

But to Paul the vision was grander and more sublime than that. He perceived in the mists of the future a Church embracing humanity and transforming human character. Such a Church was not to steal secret and ashamed through the ages, but was to lift itself high into all men's view and challenge the soul of the nations with its purity and its unanswerable holiness.

HOW PAUL WAS ONCE AGAIN DRIVEN INTO EXILE

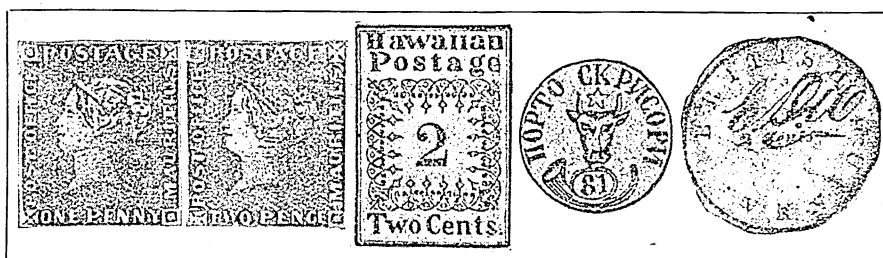
Therefore it was that his bold preaching stirred the muddy waters at Jerusalem, and once more revived the storm of anger and persecution. Paul, with his clear vision, could not hide Christ's light under a bushel. He wanted all men to see the Great Light. So he preached with the fearless energy of his soul, and suddenly presented Jesus to Jerusalem as the Son of God, Saviour of all mankind.

He was marked down for death. Such preaching was unthinkable in Jerusalem. As he had been marked down at Damascus for stirring up strife, so he was marked down in Jerusalem; and now, as then, he was saved by flight. He had to be hurried out of the city. Once more we find him, on the threshold of his burning purpose, driven into exile, a homeless man, frightening his friends and rousing his enemies to fury. He went to Tarsus, and the chronicle says, significantly: "Then had the Churches rest throughout all Judaea and Galilee and Samaria."

Rest! Yes, they rested, and the nations of the Earth continued to live as if the Son of God had never brought life and immortality to light.

We are now at an incident in our story which reveals to us the wonderful spread of Christianity throughout the world.

The Interests and Pleasures of Life for All Indoors and Out



The two, Mauritius stamps on the left were sold for £1920. The Hawaiian stamp was bought for £700, and the Moldavian stamp next to it for £275. The British Guiana stamp on the right realised £500.

A COLLECTION OF STAMPS

THE collecting of British and foreign postage stamps is a hobby that is both interesting and instructive, and a really fine collection containing hundreds, and perhaps thousands, of stamps is a thing of artistic beauty, for many of the stamps issued by different countries have artistic designs and are beautifully engraved. Let us think for a moment of some of the ways in which we may learn from a collection of stamps.

In the first place we shall get to know a great deal of geography in a very pleasant way. The sorting out of our stamps into their various countries, and the placing of the stamps of colonies under the motherlands to which they belong, will fix in our minds a great deal of geographical knowledge.

Then, in the second place we shall get to know a number of foreign words. There are the names by which the different countries are known in the countries themselves, and the coins of the various lands as represented by the values set forth on the stamps. We shall also learn much history from our postage stamps, for it has become the custom in many countries to enlarge the size of the stamps, and to place on them various scenes and incidents in the history of the country.

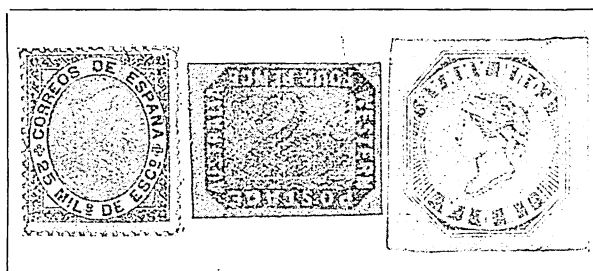
Further, we shall get to know what some of the countries are like, for many of the stamps have pictures of cities, or mountains,

or other scenes in the countries. Finally, we shall learn the emblems of many of the lands from the stamps, as, for instance, the cross of Switzerland.

The number of stamps now in existence, especially since the Great War, is so enormous that many collectors confine themselves to some section, such as the British Empire, or the stamps of a particular continent, such as Europe or America. Some who can afford the rarer ones do not collect stamps later than a certain date, and so on.

Stamp collecting is a hobby that need

cost nothing, and yet may cost thousands of pounds. There are some rare stamps that cost originally 1d. or 2d., and can now only be purchased for about £1000 each; a collection like one in the British Museum



These three stamps, a Spanish, a West Australian, and an Indian are worth £1250, because, in printing, parts of the designs were by accident turned upside down. The correct issues are worth only a few shillings.

is estimated to be worth over £100,000. But while this is the case, any boy or girl can begin collecting at once without spending a penny.

The ordinary stamps that we use for our newspapers and letters and parcels, the halfpenny, penny, three-halfpenny stamps, and so on, will all be needed for our collection, so we can begin by getting good specimens of these. No doubt we have some friends in offices where foreign letters are received, and we should ask them to save us any foreign stamps they may not want.

CRAFTS • GAMES • NEEDLEWORK • PUZZLES • SCIENCE EXPERIMENTS

THINGS TO MAKE & DO

Then perhaps we have friends abroad, who could send us from time to time a batch of used stamps of the land they are in. In these ways we shall begin to form a collection for next to nothing.

But as we get interested in our hobby we shall be glad to spend some of our pocket-money in adding to our collection. Our earliest purchases can be inexpensive packets of stamps, and though we must not expect to obtain in this way any valuable specimens, we shall find that the cheap packets will, until our collection has attained a considerable size, constantly provide new varieties for us. The duplicates will come in useful for exchanging with other collector friends.

Of course, if we can afford them, the more expensive packets will contain more valuable varieties, and will fill up many vacancies in our collection. But we must be sure to buy these packets only from reputable dealers who are above suspicion, as forged stamps are sometimes found in them.

We should from the beginning set about our hobby in the right way. A mere mass of all kinds of stamps, without order or arrangement, is useless. We must endeavour to obtain complete sets of each particular issue of stamps, as, for instance, the present King George stamps used in Britain. It will be easy to get the halfpenny, penny, three-halfpenny stamps, and so on, but when we come to the half-crown and five-shilling stamps, these are less easy to obtain because so few are used. But we must not get discouraged. Sooner or later we shall find an opportunity of filling up the blank spaces in our collection.

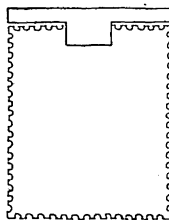
As with British stamps, so with foreign and colonial. We should endeavour to complete our sets of different issues, putting the various values in their proper places and order. And this brings us to the question of how we are to keep and arrange our collection. There are many excellent albums sold with pages set apart for the different countries and places for the various stamps. They range in price from sixpence to a sovereign according to their size, the quality of their binding, and so on.

But it is not necessary to buy one of these ready-made albums. A plain, thick exercise book will do, or two or three thinner books, and, as a matter of fact, it is much the better plan to make our own album. We should rule a border round each page, leaving a margin of about half an inch all round. Then we should rule spaces to receive the stamps, and above each row we should leave about a quarter of an inch for a line stating the date of issue and other particulars.

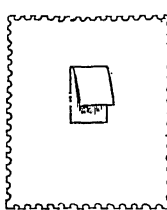
There are different ways in which we can arrange the countries. Some put them in strictly alphabetical order; but a better arrangement is to place Great Britain first, with her colonies and dependencies following, and then to divide the remainder of the book, or the books, into five divisions—Europe, Asia, Africa, America, and Australasia, subdividing these into their various countries in alphabetical order.

As to the space that should be allotted to each country, this varies very much. Some countries, like Spain, which have produced a large number of issues, will need seven or eight pages, but for most States three or four pages will be sufficient. There are some countries, like Naples, that no longer exist as separate States, and do not now issue stamps. One page will be sufficient to allow for each of these. It is better to use only one side of each sheet in the book, leaving the other side of the paper blank.

It is important to mount the stamps in the album properly. On no account let us gum or paste the whole of the back down on the page. This spoils the stamp, takes away from its value, and makes it difficult, if not im-



Two different ways of fixing the postage stamps to the pages of the album



possible, to remove the stamp from the album. There are two ways of fixing our stamps. We may make a little hinge of tissue-paper at the top, as shown in the first picture on this page, gumming only a small piece to the stamp itself; or we may double a little piece of paper and stick one part to the stamp, as shown in the second picture, and the other to the page. Either plan is good, and does no damage to the stamp, making it easily removable, though holding it securely. It is, of course, essential that we do not use a gum or paste containing any chemical that will damage the stamps.

Moisture spoils the colour of a few stamps, particularly some Russian issues, but it is by moisture that we have to remove most stamps from the paper on which they are stuck; for stamps should not be put into the album while they have paper adhering to them.

To remove the paper, take a saucer of water, slightly warmed, and lay the stamp on the water, face upward, taking special care not to wet the surface. The stamp will curl up, and then straighten out again, when it should be removed, dried gently, first in a cloth and then in blotting-paper. It is now ready for operating on, and with great care we should remove with a penknife the paper that sticks to the back. It is important not to damage the edge, or perforation, of the stamp in any way, as such damage greatly spoils the value of a stamp. Some rare specimens would be worth hundreds of pounds less if their perforations were torn off.

A COLLECTION OF STAMPS

Stamped envelopes—that is, envelopes which have the stamp impressed on them—and postcards, and newspaper wrappers, should be preserved complete, and the stamps should on no account be cut off. It is best to have another book for these, and, to save space, they may be stuck in overlapping one another. The envelopes, cards, or wrappers should not be folded, as this spoils their appearance and also their value.

As we make progress with our collection we shall probably put aside some of our pocket-money to buy single stamps that we need. There are many responsible dealers who issue catalogues, but we must be on the look-out for forged specimens, for there are many about, especially since the war. They can generally be recognised by their bad printing, and by the spurious postmark which is generally made to appear at one corner. Then many stamps have been reprinted from the old dies after the issue has

ceased to be in circulation. These are of little or no value, and they can often be recognised by the indistinct lines of the design, the dies having been more or less worn out when they were printed.

We may mention a few of the technical terms that are used by stamp-collectors and that we ought to know. An envelope stamp is a stamp printed on an envelope. An overprint is anything added after a stamp has already been printed. This is sometimes done to render it suitable for some particular use. Perforations are the little holes cut between stamps to enable them to be torn apart easily. A surcharge is a mark, or figure, or word, added to a stamp after it is printed to change its value. The watermark is a design in the substance of the paper, which may be seen by holding the stamp up to the light. Finally, the proper name for the study of postage stamps is philately, and a stamp-collector is a philatelist.

HOW TO FIX AN ELECTRIC LIGHT IN A CELLAR

AN electric light can be fixed up in a cellar, box-room, or any other small chamber with little trouble and expense.

A few things have to be bought such as the wire, bulb, and battery, but the switch can be made out of odds and ends, and the whole arrangement should cost less than four shillings. The convenience of having a light in the cellar or in a dark box-room, with a switch handy at the entrance, is obvious, and any intelligent boy can fix it up.

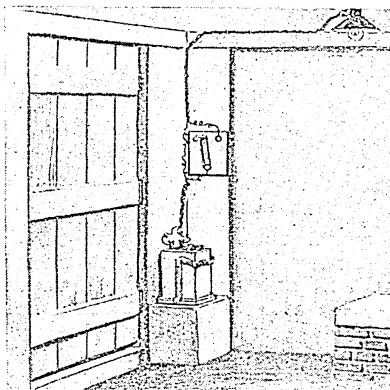
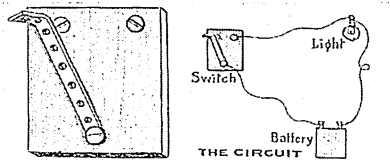
A small sixpenny bulb of 3.5 volts with a threepenny holder and a sixpenny reflector is quite enough; the wire should cost not more than a shilling and the battery about 1s. 9d. If we prefer an accumulator we can get one for half-a-crown which can be recharged from time to time. Flex wire, in which two wires are twined together, is the most convenient sort to use.

The first thing to decide is where the battery is to go, and this should be kept either out of the way on the floor, or on some convenient shelf. The light can be arranged on a beam of the ceiling or on the wall, and the switch by the door in the most easily accessible spot for the hand.

We must next plan the best route for the wire. It is always well to carry this, as far as possible, along angles of the wall where it is not likely to be knocked and damaged.

We now make our switchboard. We take a piece of wood about an inch and a half by two inches and half an inch thick. We place two brass screws at the top, one on the right to make the connection and one on the left to act as a stop for the switch.

The switch can be a piece of stout wire with some spring in it, a strip of zinc, or, best of all, an eleven-hole strip of meccano. The top we bend over to make a handle, and the bottom we attach to the board by a small brass screw.



THE LIGHT FIXED IN POSITION

Everything being ready we now begin the wiring. Unwinding a little of the flex wire, we fasten one strand to one pole of the battery and the other strand to the other pole. Then we carry the wire to the switch-board, separating the two strands, and fixing one to the lower screw on which the switch works, and joining the other broken end to the top right-hand screw where the connection will be made by moving the switch. The double wire is then carried to the light, one end

being fixed to one terminal and the other end to the other terminal.

The whole arrangement is thus complete, and if the switch is turned over to touch the top right-hand brass screw on the switch-board the light should shine. By turning the switch to the left the light is extinguished.

The pictures make it all quite clear.

WHAT ARE THESE THINGS?

HERE are descriptions of a number of things mentioned in this book. It will be a good game to play at a party, to see who can first guess the correct answers, which are given in Section 50 of Group 18.

1. What is this round prickly ball, covered all over with spines like a hedgehog? It comes from the south of France, where the natives take off the prickly coat, and are in the habit of boiling the three brown things inside and using them for a nourishing food. In England too we eat this article, baked, boiled, or made into puddings, but not into bread. It is hard and sweet when baked, soft and flowery when boiled. If Devonshire were only dry as well as warm, we should get fine specimens from that county; but as no fine large ones will grow in the British Isles we have to rely on the warm countries bordering the Mediterranean for our supply.

2. For weeks at a time hundreds of boats are busily at work in the North Sea, hauling in treasures of the deep, which the small steamer takes away to the London market. In fine weather or boisterous gales the work of casting and hauling the drift-nets goes on. It has been calculated that altogether these boats take 2200 million of the silvery treasures from the sea around our coast. The poor people are always glad to have this wholesome and nutritious article of food, which is appetising and satisfying, whether eaten fresh or salted.

3. We have various uses for leaves. Sometimes we use them in making clothing; more often we eat them. This pointed, laurel-shaped leaf grew on a plant in a country of southern Asia. A boy picked it, and put it with others on a round tray to dry in the sun, until it became spotted and gave out a peculiar odour. It was then roasted, and rolled with the hand to squeeze out any moisture remaining. Next it was put in a sieve over a fire. Soon it turned quite black, and now looks a dried-up, useless bit of black stuff. But it is so valuable that it has been sent hundreds of miles by sea to us. In it there is a stimulating property which makes people who use it feel no longer tired; but to take very much of it would be injurious.

4. A tiny egg weighing the one-hundredth part of a grain is hatched in a little bag worn round someone's neck. The little creature is fed on leaves, and, as it grows big, splits its skin, and wriggles out of it. Three times more it casts its skin like this. When it is large, fat, and about three inches long, it works together two little streams of a sticky fluid that comes from its body, so that this forms a nice, cosy covering for it. From two

to five days this busy work goes on, the little head seeming to do all the work of pressing the sticky fluid into a thick substantial coat—so thick, indeed, that the creature becomes quite invisible. No person can make such a wonderful thing as that coat, nor can any plant produce it. The thread composing it is soft and smooth, and we make it into all kinds of things—hats, shoes, gloves, umbrellas, and balloons. This wonderful product is in demand all over the world.

5. Some plants like brilliant sunshine and blue skies; but there is one plant, of great value to mankind, which flourishes best in a land where summer is cool, and the rain frequent. What the botanist calls the fruit grows on a spikelet, and has a tough husk to protect it. If the husks are eaten in large quantities they are rather indigestible; and the difficulty is to get rid of the indigestible husk, and yet keep all the nutriment of the inside. The plant is a most valuable food, and the vigour of mind and body characteristic of the Scottish race is attributed to its use.

6. Nature provides us with many delicious things to eat. One that most people like is made by the skill and intelligent work of a tiny creature that loves the sunshine, blue skies, and brightly-coloured flowers. On a fine summer day it flies miles to find food for itself and the young ones at home; and it stores up what is not wanted in regularly-shaped cells that are made by itself and its companions. Being prudent, it thinks of future needs, and stores a big supply of food for the dark, frosty, winter days to come. But people, even babies, like that food, and so artificial storage places are arranged for its reception. This product, which is eaten with bread and butter, may also be put into cakes or used as medicine.

7. Thousands of miles away from England men are hard at work picking something off trees. The harvest from the trees is quickly packed in barrels, thousands of which arrive in England about Christmas-time. Some of the fruit will be eaten raw, some made into puddings, some into jam or jelly, some into sauce, and some of it, grown at home, will be made into a drink. The fruit is pretty in appearance, and very wholesome, for it contains a good deal of iron. It may be that specimens in the same dish have come from not the other side of the globe or from Canada, but from our own garden; if so, we shall probably find that these have thinner skins, and, though they may be smaller, as a rule they have a much better flavour than the "foreign" ones.

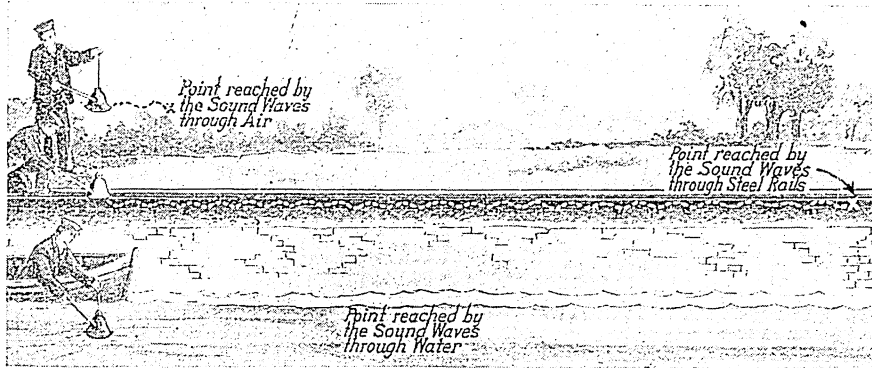
ANSWERS TO THE GAME OF WHAT-ANIMALS-ARE-THESE?

ON page 5934 are some descriptions of animals, and we have to guess their names from the descriptions that are given.

These are the names of the different creatures:

- | | | |
|-------------|------------|-------------|
| 1. Spider | 3. Giraffe | 5. Bat |
| 2. Tortoise | 4. Amoeba | 6. Porpoise |

The Story of the Boundless Universe and All its Wondrous Worlds



This picture shows us how far the sound waves made by the ringing of bells would travel through air, steel, and water in a certain given time if the bells were all struck at exactly the same moment.

THE WAVES OF SOUND

IN order to have light it is necessary that there shall be not only something outside our bodies, but also an eye to see that something. All Nature is in darkness except where there are eyes to see.

In the same way, "the silence that is in the starry sky" is never broken on the Earth except where there are ears to hear. We are now going to study the something outside ourselves which the ear responds to. We may call that something Sound, but it is not really sound till there is an ear to hear it.

As light is a wave motion, so is sound, and certain facts which are common to all kinds of wave motion are therefore true of both light and sound. But otherwise the differences between these two kinds of wave motion are very great. Anything that carries, or conducts, or conveys, we may call a *medium*, which really means the "thing in the middle." Sound, then, unlike light and radiant heat, is a wave motion in a material medium. This medium is very often air, but it may be a gas or mixture of gases; it may be such a liquid as water, or it may be a solid body.

Where there is no matter there can be no sound, for sound is not conveyed by the ether. It follows that no disturbances on

the Sun or the Moon could ever produce a noise that we could hear, because beyond the limits of our atmosphere there is nothing but the ether between us and these heavenly bodies, and though the ether conveys light, it cannot convey sound.

When we say that sound is a wave motion, or a vibration, we make a statement which anyone will agree is true who has seen or felt what happens when sound is produced. For instance, we may hold a piece of string tightly, one end in each hand, and then suddenly pull it. It will actually be seen to vibrate as it produces a little musical note.

The same is true of a piano wire. If we touch a bell that has been sounded we can feel that it is vibrating; also we know that, in such a case as that of a tumbler which has been struck, the finger which stops the vibrations stops the sound at the same time, proving that the vibrations are the cause of the sound. Every time the string or the bell moves it gives the air a little kick, and so there is produced a series of waves which reach our ear, and then become sound.

It is easy to prove that the air, and not the ether, conveys these waves. We may put an electric bell in a transparent vessel and set it going, and then we may start to draw

EARTH AND ITS NEIGHBOURS

the air away by means of an air-pump. As we reduce the amount of air surrounding the bell, our sight of the bell is not affected, because we see it by light which travels through the ether; but the sound of the bell gradually becomes fainter, until at last it ceases. The bell itself is vibrating as it was before, but if there is no longer any air round it, it cannot create the waves we call sound. Then, if the air is gradually admitted again, the sound will return. This simple experiment teaches us not only what it is that conveys sound, but also that the loudness of sound depends largely on the state of the air.

WHY SOUND TRAVELS MORE QUICKLY AT ONE TIME THAN ANOTHER

When we compare the speed of light and sound we find a great difference. We see the puff of smoke from a distant cannon some seconds before we hear the report of the explosion. Light travels so fast that, however distant the gun is, we see the flash in fractions of a thousandth part of a second. But sound travels comparatively at a very slow speed, and this speed can easily be reckoned.

The speed of light and of radiant heat is always exactly the same in any circumstances, so far as we can discover. This, however, is not at all true of sound, the speed of which varies considerably with different circumstances.

We may notice at once that, fortunately for the art of music, the speed of sound varies only in very small degree with its pitch or with its loudness. It would be a very serious matter for the hearing of music if, when we were listening to an orchestra, the sound of the flutes reached our ears a beat or two before the sound of the double basses, when the composer meant us to hear them together; or if a tune, being loudly played by one part of the orchestra, and softly accompanied by another part of it, reached our ears before or after the accompaniment.

WHY A NOISE WILL TRAVEL FASTER THROUGH IRON THAN THROUGH AIR

The ordinary speed of sound through air is about 1100 feet a second. As the temperature of the air rises it becomes slightly more elastic; it rebounds better when struck, so to speak, and therefore the passage of sound through it—which entirely depends on the elasticity of the air—is made easier. The speed of sound, therefore, increases somewhat with a rise in temperature of the air, so long as the

air is of the same density. If we understand this principle of elasticity, we shall see why it is that sound passes more rapidly through liquids than through gases, such as the air, and still more rapidly through solids.

Such a metal as iron, in the solid state, has much greater elasticity than air, and sound will travel through it about seventeen times as fast as through air. This means that waves of the same shape which pass through air, pass in and through the solid iron. It is possible to make a confusion here about speed, and therefore we must just explain that the pitch of a musical note depends on the number of waves striking the ear in a second. This is quite a distinct question from the rate at which the waves travel through the air or anything else.

A given sound conveyed through iron will reach the ear about seventeen times more quickly than when conveyed through air, but its pitch will be the same in both cases, because the number of vibrations occurring in each second is the same in both cases, though they get through the iron so much more quickly.

When we come to study the loudness of sound we find that the first law about it is the same as the law of other wave motions, such as radiant heat or light.

WHY WE HEAR WELL ON A CLEAR AND FROSTY NIGHT

In the exact language of science, the law is that *the loudness of sound varies inversely as the square of the distance*. This is simply a neat and quick way of saying that, if we walk three times as far away from the source of the sound as we were before, its loudness will be not one-third of what it was, but one-ninth of what it was, nine being the square of three. The square of a number is the number multiplied by itself.

That is all there is to say about the power of such things as light and gravitation; but in the case of sound other things come in, for the density of the medium which conveys it is very important. On a frosty night the air is very dense. One consequence of this is that a motor-car runs better, because the engine gets a better supply of oxygen. Another consequence is that sounds are heard more loudly.

At the seaside, when we watch the waves rolling up against a breakwater

THE WAVES OF SOUND

or a cliff, we know that they may be reflected, or bounced back. Often the waves may be broken up, and what exactly happens will depend on the kind of surface they strike against. But if it is a smooth, flat surface, we see that the waves are reflected from it, almost as a ball is from a wall. Now, if sound is really a wave motion, we should expect that it could be reflected as the waves of the sea may be; and this is indeed the fact, as we shall soon see.

All wave motions can be reflected. What is true of sound is as true of radiant

for the influence of gravitation; if, on the other hand, we throw it slantwise, it comes off the wall slantwise.

This is equally true of sound and radiant heat and light. One of the points to notice is that the level, or plane, as we say, in which the wave approaches the surface is the same as that in which it comes off. For instance, suppose the sound were running along on the level of this paper, and then struck obliquely (or slanting-wise) a wall at the edge of the paper, it would come back not only at the same angle at which it approached the



IN THE DOME OF ST. PAUL'S—LISTENERS TESTING SOUND IN THE WHISPERING GALLERY

heat and light as of the waves of the sea. There are certain laws which apply to these very different cases. The first, stated in scientific language, is that *the angle of incidence and the angle of reflection are equal*. This means that the angle at which the wave approaches the surface is the same as the angle at which it will leave the surface. The same applies to a billiard-ball striking the cushion of a billiard-table or to throwing a ball against a wall. If we throw the ball straight at the wall, it comes back straight, except

wall, but still travelling on the level of the paper—not bent upwards or downwards so as to travel either above or below the level of the paper.

This is true also of light and radiant heat. We all know that sounds seem different in the open air when compared with sounds in a closed room; we know how different our voices sound in different places. All this is a question of the reflection of sound. The most striking way in which we can prove to ourselves that sound is reflected is in hearing an echo.

EARTH AND ITS NEIGHBOURS

One of the ways in which we can test for ourselves the rate at which sound moves is to make a sound at a certain distance from an echoing surface, and then notice how long it takes the echo to reach our ears. There are echoes in Nature besides those we make ourselves, and the best instance of reflection of sound causing an echo is a peal of thunder.

Thunder is a disturbance in the air forming a sound, made by the passage of lightning from cloud to cloud, or from cloud to earth. If there is no echo we simply hear a single clap of thunder. When we hear a peal we simply hear that clap of thunder echoed again and again from cloud and earth.

THINGS THAT MUST BE REMEMBERED AT GREAT MEETINGS AND CONCERTS

In places made for speaking or for music, echoes are often a great nuisance. All our success in listening to a speaker, and all our pleasure in listening to music, depend on the absence of any echoes that can be noticed. In one of the most famous halls in London it was almost impossible to hear music with pleasure because of the echoes from its great round wall.

Thus, when a player struck a single chord on a piano, it sounded in almost every part of the hall like a quickly-repeated chord.

The case is still worse in listening to a speaker, because everything depends on our hearing each syllable, apart from any echoes of words previously spoken. Many devices have to be adopted in order to prevent, as far as possible, the reflection of sound in such cases. Tapestries and hangings, and so on, are bad reflectors of sound, and may be of service; wires stretched across the hall above the heads of the audience may often help to break up the sound waves, so that they are, at any rate, not reflected from the roof.

TWO MEN WHO TALKED TO EACH OTHER WHEN A MILE APART

The people themselves, by their mere presence, improve the properties of a hall for speaking and singing, because their bodies form a broken surface for the floor of the hall, and the sound waves are broken up as the waves of the sea are broken up when they strike an irregular cliff as compared with a flat breakwater.

When the surfaces are far away from the speaker or the musician, time is taken in the reflection, and so a distinct echo is heard. But if the sound is produced

close to a curved surface, as in the case of many churches, the echo occurs so quickly that, instead of being heard by the ear as an echo interfering with everything, it blends with the sound of which it is an echo, and simply makes it more clear.

There are other ways in which the principle of echoes can be turned to good account. It is recorded that two Arctic explorers talked to each other at a distance of over a mile, their voices being beautifully reflected from the smooth sheet of ice between them.

The Whispering Gallery of St. Paul's Cathedral is really an illustration of the same thing. The principle of echoes, or the reflection of sound, is invaluable in every case where we employ anything in the nature of a trumpet. The use of the outer ears of animals depends on the reflection of sound, as do the artificial ear-trumpets made for deaf people. Sound is reflected from side to side of the ear or the ear-trumpet until it reaches the place where it is to be heard.

We know that light may not only be reflected but also bent, or *refracted*. That is what happens when we concentrate the light of the Sun by means of a burning-glass on a piece of paper; and it also happens in many other cases. Now, it is very interesting to discover that sound can be refracted in its course, as light can. The refraction of light is extremely important; the refraction of sound is of no practical importance, but is interesting because it teaches us about wave motion.

AN EXPERIMENT WITH A SWINGING BALLOON AND A WATCH

If we take a big bag or balloon, and fill it with carbon dioxide, we find that this bag acts towards sound as a lens acts towards light. The sound waves will be bent by the gas in the balloon, and they will be brought to a focus on the other side of the balloon, just as sunlight may be brought to a focus on a piece of paper by means of a burning-glass.

Thus, as in a well-known experiment made by Lord Rayleigh, a great student of sound, we may stand opposite a watch at such a distance that we can hear nothing. But if a balloon filled with carbon dioxide is made to swing slowly from side to side between us and the watch, and if we are just at the right distance, then, when the balloon is in the middle of its swing, and focusses the sound waves, we shall hear the watch ticking.

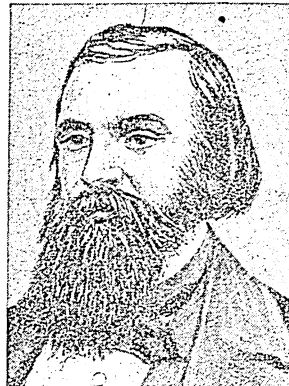
The Story of Immortal Folk Whose Work Will Never Die



Edward John Eyre



Ludwig Leichhardt



John McDouall Stuart

THE MEN WHO MADE AUSTRALIA KNOWN

DOWN in the great South Sea of the old traveller's dreams there is an island continent of three million square miles and a young British nation of nearly six million people. The continent is one of the oldest land masses in the world; the nation is one of the youngest.

The history of this nation is as strange, as romantic, as stirring, as anything to be found in the annals of mankind. "What are you, my good woman?" said Sir Walter Scott to an aged woman who begged of him.

"Your honour, it's a poor old struggler I am—just that," she answered.

If we ask the people of the Australian nation what they are they may proudly answer: "We are just young strugglers, honourably that." They have had one of the hardest tasks ever set a people, and they have done marvels.

In a nutshell the story is this. We sent the first of them out to this great land saying, *Go and possess it*, and they did not know what they were to possess. They settled down at Sydney on less than twenty square miles of land, called it New South Wales, and declared it British. They were landed on an unknown sea-coast, and for a quarter of a century they never got more than fifty miles inland. Australia was a closed book to them.

The Blue Mountains, towering behind the coastline, kept them prisoners for 25 years. All that time they were trying to find a way through or over, and they failed; route after route led them to Castle Despair. But at last, after a quarter of a century, Gregory Blaxland went boldly up the mountain face and over, and, cutting his way through dense scrub for sixteen days, looked down on the Land of Promise.

There before him, over the mountains, was land smiling like an English meadow, pasture for herds and flocks, life for human beings. It was emancipation from that terrible prison-house on the storm-wrack'd coast.

It was emancipation in more senses than one, for of the 1163 people who reached Australia on the seventh of February in 1788 no less than 565 men, 144 women, six girls, and five boys had gone from our prisons.

We had just lost one nation in America, and so we were founding another; and it was founded on prison wrecks. Our ancestors of those days were not more cruel than we are now, but they had inherited ideas as to how crime should be punished. There were scores of small offences for which death was the penalty, and still more punished

EXPLORERS · INVENTORS · WRITERS · ARTISTS · SCIENTISTS

MEN AND WOMEN

by transportation overseas. So hundreds of men from our prisons were sent out with this batch of emigrants who were to begin the history of Australia.

It is not necessary to assume that every man among them was a perfect gentle knight, as Chaucer says, but it is true that most of them were mild offenders. Many of them became splendid characters, tradesmen, lawyers, doctors, schoolmasters; the really bad continued bad and became worse.

THE TOWN SET UP AMID COPPER AND SILVER AND GOLD

Well, there they were, with one sheep and a little herd of cattle, which at once ran away and was lost in the bush for the next six years. Blaxland's discovery was the first way out from the little area in which they were settled.

The new land was at once possessed, and in the year of Waterloo—which finally convinced Napoleon that he was not to have either Little Treasure Island or this wondrous continent he had also coveted—the first inland town was established. It was Bathurst, set amid gold and silver and copper and slate, though of these things nothing was to be known for another generation. But, once there, the enterprise of these people bore its fruit, and rivers were found, the great Liverpool plains were revealed, with a way out to the sea at Port Macquarie, and the twenty square miles of colony was found to be only the gate to 120,000 square miles.

Gradually some sense of the realities was grasped, and the Australians found that they were in a land where it is summer when winter has the northern half of the world in its grip, a land whose climate is largely tropical, where enormous deserts of sand and stone are sandwiched between vast areas of prickly scrub and multitudes of eucalyptus trees; where all the animals are strange to the rest of the world; where rivers are few and for the most part, instead of running to the sea, flow inland and lose themselves in the desert, yet where land is fair and good to stock and for purposes of cultivation.

THE PRIMITIVE PEOPLE OF THE GREAT ISLAND CONTINENT

Then there was the problem of the natives, the strangest and most primitive of peoples—savages, cannibals, wielding a marvellous weapon in the boomerang, and able to make fire by rubbing wood on wood, yet too ignorant to build a hut;

matchless as climbers and trackers, but generally beast-like in their habits, and filled with superstitions and terrors.

The natives, indeed, played their part with us in the opening-up of this mighty land of which they had made not one particle of use. Escaping convicts treated them with fearful cruelty at times, and so kindled a vengeful spirit in them. We read of one man cutting off a native's finger to make himself a pipe-stopper.

Yet these poor creatures could be affectionate and faithful. All the big exploring trips included natives, and great things these poor people did at times; terrible things, too, often. To some of them a white man was a meal; to others he was a god, and some would face him as Caliban on his island faced Trinculo in Shakespeare's *Tempest*, when he said:

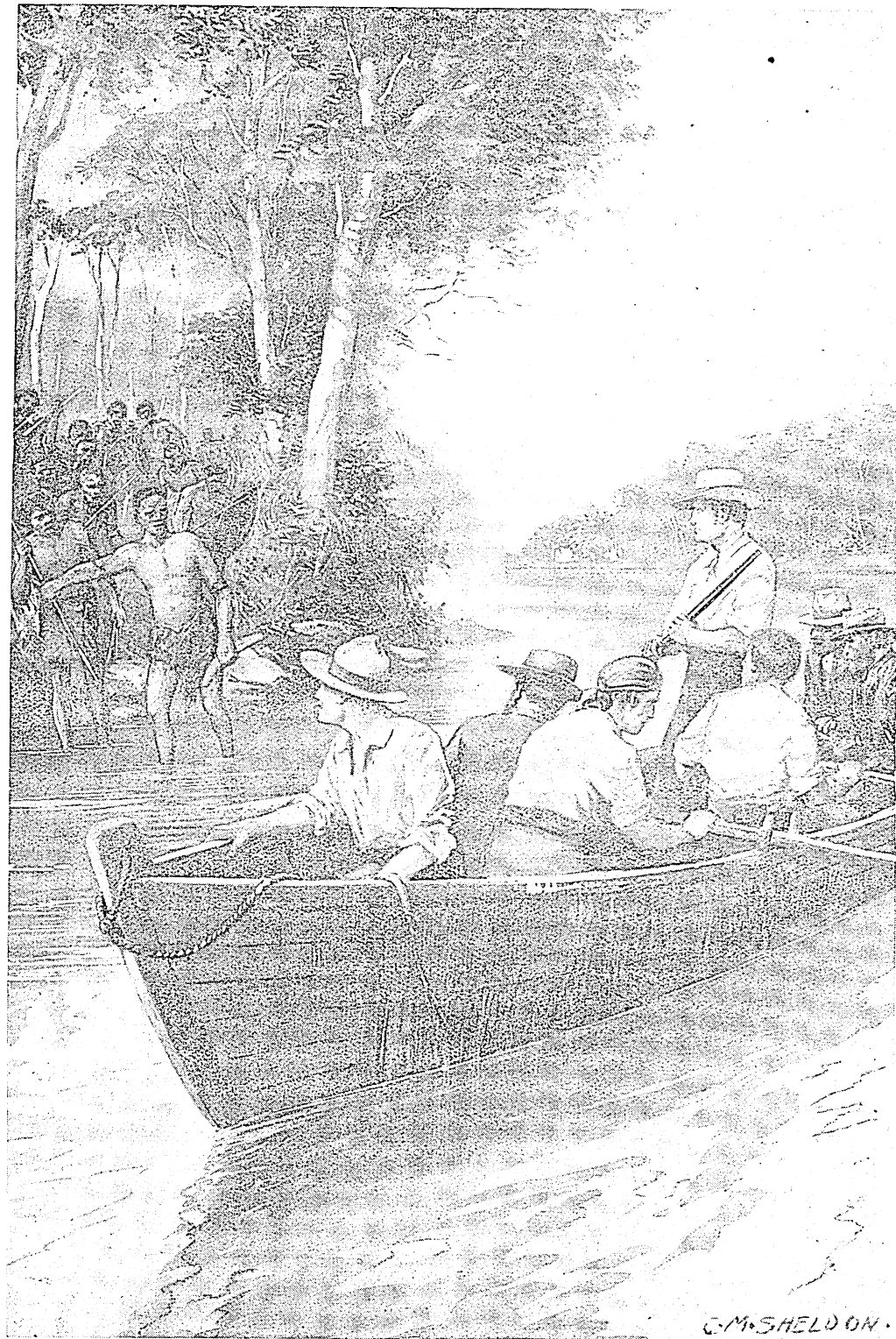
Hast thou not dropped from heaven? I'll show thee every fertile inch of the island? I'll kiss thy foot; I'll swear myself thy subject. I'll shew thee the best springs; I'll pluck thee berries. I'll fish for thee, and get thee wood enough. I with my long nails will dig thee pig-nuts; show thee a jay's nest, and instruct thee how to snare the nimble marmozet.

Services of this kind the Blackfellows often rendered the early settlers, though many a brave heart was stayed in mid-journey with a native spear through it.

JOHN OXLEY AND HIS DISAPPOINTING JOURNEYS ALONG THE RIVERS

Even an Australian Caliban would have been esteemed by John Oxley, the first of the great adventurers into the interior, who, in 1817, traced the way of the River Lachlan, was led into a world of swamps wherever he turned, and went back to Sydney believing an inland sea to be beyond the point at which he failed. A second trip brought to light stretches of the Macquarie River and the existence of many others. His, indeed, was a rare haul of waters in name, but little, alas, in reality; for Australia is a land of disappointing rivers. One of the rivers he found was the Brisbane, on which the city of that name stands. But the next great discovery was that of an adventurous botanist, Allan Cunningham, who, breasting the Liverpool Range, came upon that dreamland of the shepherd, the Darling Downs, an unrivalled pasture of six thousand square miles in an unbroken piece. What hope and courage must have

A DRAMATIC MOMENT ON THE MURRAY RIVER



G.M. SHELDON.

A SAVAGE HERO COMES BETWEEN HIS TRIBESMEN AND THE GREAT EXPLORER STURT, AND
BY HIS BRAVE ACTION SAVES THE WHITE MAN'S LIFE

come to the young colony with this discovery! The year was 1827, and in 1828 the new land began to make true history

Captain Charles Sturt reached Australia as a soldier, but, resigning his commission, he led an expedition from Sydney in search of the inland sea which Oxley had imagined. So hopeful was he that he took a little boat on wheels. With him was Hamilton Hume, a rare spirit; and they had two soldiers and eight convicts to keep them company.

There are wet seasons and dry seasons in Australia. Oxley had explored in a wet one; here was one of the opposite kind. The land was parched so that it split the hoofs of the horses. The great ostrich-like birds stood gasping with the heat, which caused even the native dogs to totter like phantoms.

Where he had hoped to find a sea Sturt found a wilderness of reeds, but after miserable sufferings, borne with firmness and dignity, the party were gladdened by the sight of a river, eighty yards wide and alive with water fowl. The delighted men rushed down the steep banks to drink, only to find the water *as salt as the sea!*

THE LITTLE RAFT WITH WHICH A GREAT RIVER WAS DISCOVERED

It was what we have ever since known as the Darling River. The party retraced their steps, wandered on, and touched the same river ninety miles farther inland, but still it was undrinkable. They found and named the Bogan, and then went back to Sydney. In his next expedition, in 1830-31, Sturt followed the course of the Murrumbidgee River. He reached the river 200 miles from Sydney, and traced it for a week, when he saw that he could not take his whole troop with him. They had a whale boat on wheels and vehicles for their goods; and he caused a little raft to be made. On this he placed such goods as could not be carried in the boat, roped the two craft together, took six men with him, sent the remainder back, and boldly struck out on the river.

The river ran faster and faster, and when his raft smashed they swirled along for days. Then, to their great delight, they were swept from this narrow and forbidding waterway out on to the bosom of the magnificent highway now known as Murray River, the greatest river of the Southern continent.

Along its broad surface they sped for nearly a month, not uneventfully. There was a moment when hundreds of natives menaced them from the shore, when, as a host of spears was about to be cast at them and Sturt was about to fire, a native of commanding manner emerged suddenly from the jungle, leaped into the water, swam to the leader of the attacking natives, pulled down his spear, covered him with his own body in front of the white man's gun, and restored peace.

THE TERRIBLE JOURNEY OF AN EXPLORER AND HIS STARVING CREW

We should like to know the history of that noble savage, but we never shall. A truly splendid deed, it saved these dauntless seven. On they went, until their river ended in a swampy lake, which they called the Alexandrina. They were near the sea, where Adelaide now stands, but there was no hope in that direction. They had no ships; they had little food; the only course was to row back the way they had come, and once more face the natives.

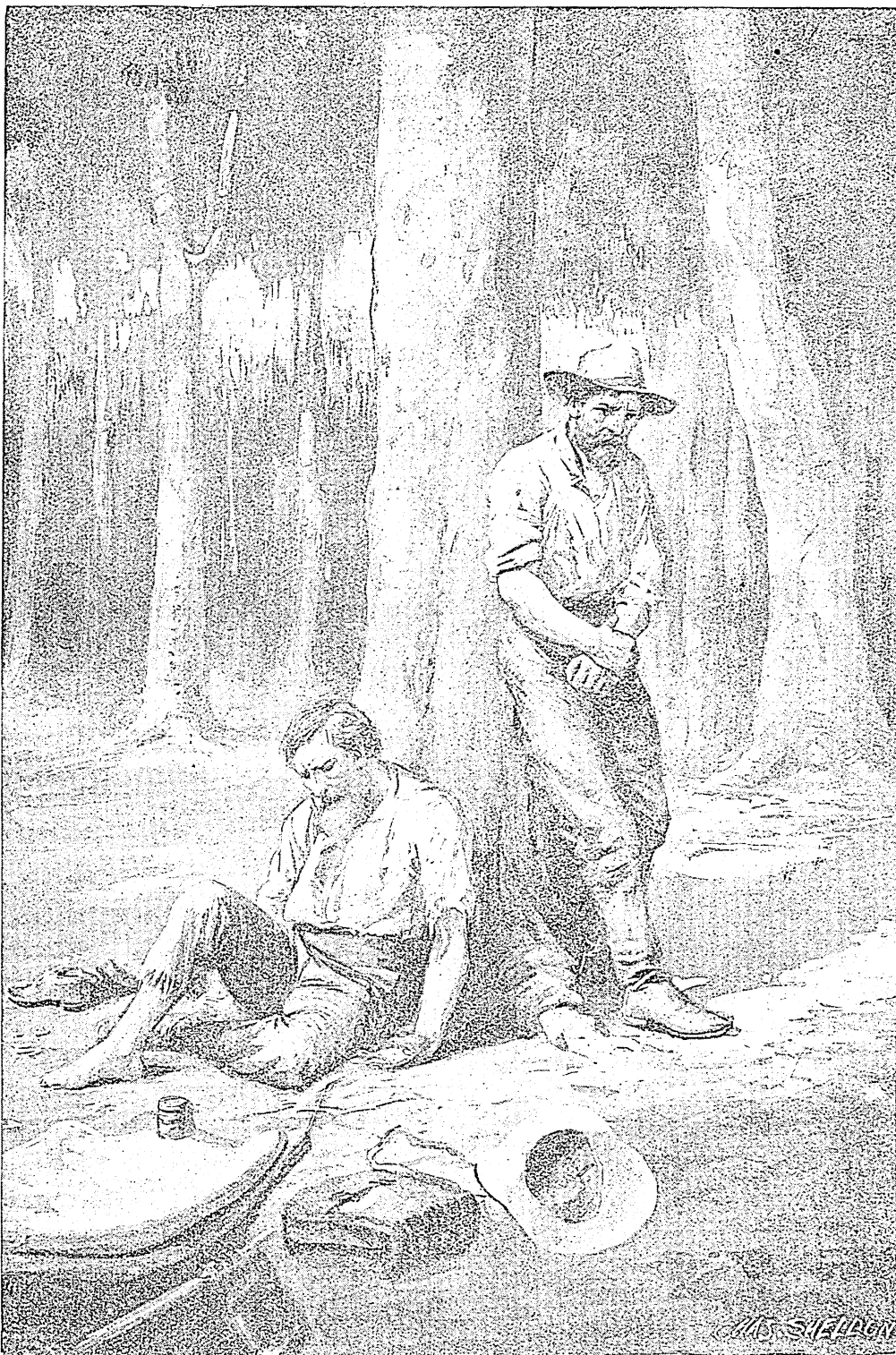
For two months this little crew urged their reluctant boat against the stream. Day by day they suffered from heat and famine, day by day they grew weaker; day by day they were in peril from the natives. But they did this great journey at last, though there was madness in the boat for the last few days. They reached the old camping-ground from which they had set out, and there they divided their last ounce of food. Then, in the nick of time, up came a rescue party with stores, and they returned in triumph to Sydney, having travelled over 2000 miles and set Australian exploration truly on its feet.

It may be said that Sturt by his discoveries had created South Australia. The province was founded five years later, and in 1838 he was appointed its surveyor-general. But the spirit of the adventurer was always his, and in 1844 he headed a new expedition, which included John McDouall Stuart, to see what lay at the back of the beyond in the new territory; the purpose of this expedition was to examine the heart of South Australia.

THE EXPLORERS IMPRISONED FOR SIX MONTHS BY THE HEAT

Leaving Lake Torrens on their left, they passed up the Murray and the Darling Rivers and struck due north. It was winter time, so water held for a while, but they reached the desert region associated with the Barrier Range and the Grey

THE LAST DAYS OF TWO HEROES



THE AUSTRALIAN EXPLORERS BURKE AND WILLS, HALF-STARVED AND EXHAUSTED, ON THEIR TRAGIC HOMeward JOURNEY AFTER HAVING CROSSED THE CONTINENT

Range. All was dry. The earth was split on the surface, and wounded the feet of the pack animals. Travelling was an agony. At last they came to a place where water welled up from a rock. Sturt called it Rocky Glen, and stayed there.

For six terrible months they were imprisoned by the heat. They explored from this centre, but found nothing but sterility. To make life bearable they made a dug-out in the earth in which to shelter from the sun, but the temperature in the shade was 130 degrees. It dried the ink on their pens before they could write; it caused the screws to fall out of their boxes; it made metal so hot that it blistered their hands; it split their combs and knife-handles into fragments, made the lead fall out of their pencils, rendered their nails as brittle as glass, and prevented the hair of man and the wool of sheep from growing.

**THE BEAUTIFUL SIGHT WHICH MET
THE EYES OF COLLET BARKER**

Slow starvation in such heat brought on scurvy, and at last there was nothing left to do but to turn home. They discovered Cooper's Creek, an important water-course; but when they reached Adelaide they were far spent, and Sturt's eyes were almost blinded by the glare of the sun.

Captain Sturt's efforts have carried us ahead of the true calendar of events. We must turn back a moment to note the bitter end of Collet Barker, of Sturt's old regiment, who went to seek a connection between the sea in St. Vincent's Gulf and Lake Alexandrina. He climbed the steep ascent of Mount Lofty, and was the first known man to look out across the lovely plains where Adelaide now stands; he found the narrow channel by which the Murray River enters the sea, and with a zealot's ardour he threw off his clothes and, plunging into the water, swam across to make sure of its width.

**THE TRAGIC FATE OF A MAN
IN HIS HOUR OF TRIUMPH**

He was never seen again. There were natives hidden in great numbers on the opposite side of the river, and his companions saw the smoke of fires ascend, and wondered why. When a search was afterwards made the truth was made known by a native woman. The blacks said they had thrown the body into the sea, but the truth is that they were cannibals; the smoke had come from their fires when they killed the Englishman, and they had held a horrible feast that night in 1831.

Now came the terrific journeys of Edward John Eyre, son of a Yorkshire clergyman, in 1840.

None of the records of the endurance of explorers surpasses his. He first made the overland journey across the desert to the north of the Australian Bight, where the telegraph line now runs between South Australia and Western Australia.

Eyre was descended from the notable Eyre family of the Derbyshire Peakland. After experience as a sheep farmer in New South Wales he became a magistrate in South Australia and official protector of the native tribes, over whom he had great influence. In this capacity he explored the country to the north of Spencer Gulf, found Lake Torrens, and reached, across 200 miles of desert, the lake that bears his name. He spoke in his Journal of this expedition as a failure, but no one thinks it a failure now. This was in 1840. In February, 1841, he decided to attempt the journey of 850 miles from Fowler Bay to Albany, across wholly unexplored country. The most sheltered part of Fowler Bay, from which the dangerous part of the journey began, is now known as Port Eyre.

**THE DESERT EXPLORERS WHO DUG
IN THE SAND FOR WATER**

The intrepid explorer had with him one white companion, Baxter, who had been his overseer, and three natives. They had a little cavalcade of nine horses, a pony, a foal, six sheep, and nine weeks' supply of flour, tea, and sugar, with some water. It was the height of summer. The first 135 miles did not produce a drop of water, and the whole party would have perished but for the water carried by the pack-horses. The horses went five days without water, and the sheep six days, and were so exhausted that all the baggage except such as was essential to life had to be abandoned. On the fifth day enough water was found to save the horses from complete collapse, but it had to be dug for, and was found at a depth of five feet.

The white men and the strongest of the natives walked all the way, and the two younger natives rode the strongest horse alternately. The next waterless stretch was 160 miles. When, at the end of this parched desert, they were in utter despair, they reached a patch of moist sand, and found fresh water six feet below the surface.

All their stores, except two guns and a small quantity of tea, sugar, and flour, had

THE MEN WHO MADE AUSTRALIA KNOWN

now been abandoned or used. The pony and two horses were dead, and only two sheep were left. They had no water, and were only saved by a heavy fall of dew in the night before they reached the underground water. Eyre had collected in the night with a sponge enough dew to fill a quart pot. Eyre stayed by the underground water while Baxter went back 47 miles to recover some of the stores. He took three horses with him, but returned with only one of them.

They were now half-way on their journey, with no hope of more water for 150 miles. Some of the abandoned stores were retrieved by Eyre going back with one of the natives, and the two carried the stores between them. At the place where the town of Eyre now stands they stayed 28 days to regain their strength, the natives eating the horses and the white men the sheep.

THE FAITHFUL BLACK BOY WHO REMAINED TRUE TO HIS MASTER

Then the worst calamity of all befell the dauntless travellers. Leaving the camp one night to attend to the remaining horses, Eyre heard a gun fired behind him, and when he rushed back he found Baxter dying, shot by two of the natives, who had deserted with guns, nearly all the ammunition, and part of the stores. Only four gallons of water were left. The black boy Wylie remained faithful, and Eyre struggled on for seven more days and nights, with the two murderers tracking him at a distance through the desert. Then again they reached water, six feet below the surface, and rested, Eyre now being desperately ill. This was at the part of the coast now called Point Malcolm. They had waited there for a week, and almost reached the end of their supply of food, when a French whaling ship, with an English captain, came into the bay. For ten days Eyre was the guest of the captain, and then, refreshed and provided with fresh supplies, he renewed his journey through less difficult country, and in another month reached Albany.

A MAN'S LONG AND TERRIBLE JOURNEYS ACROSS A CONTINENT

Afterwards Eyre became Lieutenant-Governor of New Zealand, Governor of St. Vincent, and finally Governor of Jamaica, where he became a centre for violent controversy because of the stern decision with which he suppressed a Negro rising.

Notwithstanding the strain he endured in his pioneering days, and the anxieties

of his later career, he died in peace at 86, after 35 years of retirement.

The next name looming large is that of the ill-fated Ludwig Leichhardt. He set out from Sydney in 1844 to cross the continent to Port Essington in the north. He had with him five Englishmen and two natives, and expected to make the journey in about eight months. It took 17 months. He had a frightful experience, one of his companions being killed and two terribly wounded by natives. All his stores were gone and his equipment quite worn out when at last the survivors staggered to their destination.

A ship took them back to Sydney, where Leichhardt had a public reception and a handsome reward. Leichhardt made other expeditions, both with the purpose of crossing from east to west, but ill luck dogged him all the way. When he was last heard of, in April, 1848, he had seven companions, 50 oxen, 20 mules, and six horses. He wrote "All well" from Macpherson's station on the Cogoon River, and then, with all his little host, vanished as if the earth had swallowed him.

Between 1851 and 1865 five expeditions went out in quest of him, and in 1861 an explorer found his old camp and a tree with L marked on it. But never has Leichhardt been seen or heard of since.

Now we come to Jacky Jacky, whose fame should live as long as Australian history is remembered.

HOW JACKY ESCAPED FROM HIS ENEMIES BY WALKING IN A RIVER

Jacky's master in 1848 was a fine fellow named Edmund Kennedy, who did excellent work in tracing a river to Cooper's Creek, and then set out, with Jacky and nine men, to explore the great Cape York Peninsula in the north of Queensland. Toiling through dense jungles and prickly shrubs, which tore the clothes from their backs and the skin from their hands, the party was in dire straits, so that Kennedy split the troop, and, in company with three white men and Jacky, pushed on for the peak of the peninsula.

One of the three was fatally injured, and Kennedy left him to the other two while he and Jacky hurried to the coast for assistance. But the chapter of disaster was near an end. Savages attacked and killed him. Jacky kept his head in this bitter hour, and frightened the wretches away with his gun. Then he dug a grave

MEN AND WOMEN

and buried his master. Kennedy had kept precious journals, and these Jacky took away with him.

In order to get through the ranks of his enemies he plunged into a river, and, walking miles with only his head above the water, he reached the sea and was carried by a ship back to Sydney, where he delivered the treasured journals of his lost master. Of the others of the party only two survived; six died of starvation.

The many expeditions sent out in search of Leichhardt added much to common knowledge of the land, and the attack had by this time been made from each coast in turn. Now we come to a period in which great spirits worked at the same time on the same plan. The travels of John McDouall Stuart, begun in 1859, mapped the continent from south to north, but in the meantime Burke and Wills laboured to their tragic triumph, and, by the saddest coincidence, Stuart entered Adelaide victorious at the moment the dead bodies of Burke and Wills were being carried through the city on the way to Melbourne.

The first attempt Stuart made to cross the continent began with cold; then rains soaked his stores and caused a horse to sink to death in a morass; then came days of thorny scrub, which tore his clothes and his horse's harness to pieces; then blindness threatened in Stuart's right eye. Still on he went, and he planted the British flag in what seemed to him to be the very centre of the continent.

The way grew worse and worse. At times the horses had to go for a hundred hours without water. Two of them went

mad, a third dashed away with him into the bush and smashed his right hand. His gums grew so sore that he could swallow only fluid; his hands festered and the muscles showed through his skin. But it was only the murderous attacks of natives which finally turned him back, when he was within 400 miles of triumph. Within four months of reaching Adelaide he was off again. Though he did not know it, Wills and Burke, taking a more

easterly route, were bound for the same goal, and actually beat him. He pursued his former route and passed his farthest north, naming creeks and wells and mountains as he went on his way.

One curious thing he found was as pathetic in its way as anything revealed in Egypt's Valley of the Kings. Propped up in the branches of a tree was a beautiful small canoe 30 inches long. It had been made with great skill, with native carving on the sides, and in it lay the body of a little native child.

The way was increasingly difficult. Nettles grew fifty feet high, stinging with a deadly poison; scrub with fierce thorns grew so long that a horseman could not be seen five yards away; and this, coupled with shortage of water, at last drove

the party back when they were within 150 miles of the coast they were seeking.

On reaching Adelaide Stuart heard that Burke and Wills were dead, but he set forth a third time, and now he conquered. Heat, privation, native attacks, long detours made to avoid the prickly jungle, accident, injury, thirst, were all borne with a noble fortitude. Natives, when they did not openly attack, fired the bush around him day after day, but the patient



EYRE WITH A NATIVE ON THE LAST STAGE OF HIS GREAT JOURNEY

THE MEN WHO MADE AUSTRALIA KNOWN

valour of this great man overcame all obstacles and all enemies.

He sought the ocean as eagerly as Columbus sought the land, and at last, on July 24, 1862, one of his party cried, in an ecstasy of exultation, *The sea, the sea!* In that moment of his happiness, after years of effort and suffering and privation, Stuart was dumb. He stooped down to the waters, and dipped his feet and washed his hands in the sea, "as I promised Sir Richard Macdonnell I would do if I reached it."

He left on the shore of Van Diemen's Gulf a flag and a notice announcing the name of his party, their route, and the date; and then he turned home. The way he went, so slowly and in such pain, is the route by which communication is now as fast as light, for Stuart's great march laid down the path by which the continental telegraph runs.

He was not the first to cross Australia from ocean to ocean, but he did the work systematically; his heroic rivals raced against death as well as against him, and, outrunning him, were themselves overthrown by a terrible fate.

THE FIRST CAMELS TO BE TAKEN TO AUSTRALIA

Robert O'Hara Burke was a gallant Irishman who had given up life as an army captain to be an inspector of police at Melbourne. With him was a gentle scientist named William John Wills, a son of Devon. It was for this expedition that camels were first taken to Australia, and had Burke been half as wise as he was courageous all might have been well. But a delay in getting his party together at the up-country depot at Cooper's Creek made him rush off with Wills and two men (Gray and King), taking six camels, two horses, and only three months' provisions. He instructed a man named Brahe to wait at the depot for three months, and then the gamble with fate began.

The four adventurers made a great rush north, and through deserts and stony wastes, through deep and deadly quagmires, they made their way towards the Gulf of Carpentaria. They did not actually view the sea, but they reached tidal waters near the mouth of the River Flinders, and found it impossible to see beyond owing to mangrove swamps. Yet they knew they had crossed the continent.

Then they turned back, with insufficient food. They killed and dried the flesh of a

camel and lived on that for a month. Then a horse was killed, Gray died, and at last three starving and half-naked men tottered into Cooper's Creek at the end of three months, to find that the depot party had departed *that very day!*

A CRUEL STROKE OF FATE FOR THREE STARVING EXPLORERS

There was a message carved on the trunk of a tree—just the word *Dig*. They dug, and found a little food. Resolved to make for Adelaide, so as to pass sheep ranches on the way, they ate their last camel and turned back in despair to the depot, beaten. Natives gave them seed to eat, but it made them ill, and they were famished. It was afterwards known that a search party actually appeared at the depot when the men were absent, and went away again while they were pining away in the wilderness.

Wills was so ill that Burke and King left him with food and drink to last eight days, while they sought help. Burke died in the open, almost a skeleton. King, succoured by natives, was finally discovered by a rescue party, and lived to enjoy a pension. Wills died lonely and resigned at the forsaken depot. He kept a diary to the last, as Captain Scott did in his tent of death in the Antarctic; and this was the last entry he made in it:

My pulse is at 48 and very weak, and my legs and arms are nearly skin and bone. I can only look out, like Mr. Micawber, for something to turn up. But starvation on nardoo is not very unpleasant, save for the weakness one feels and the inability to move oneself. As far as appetite is concerned, the food gives me the greatest satisfaction.

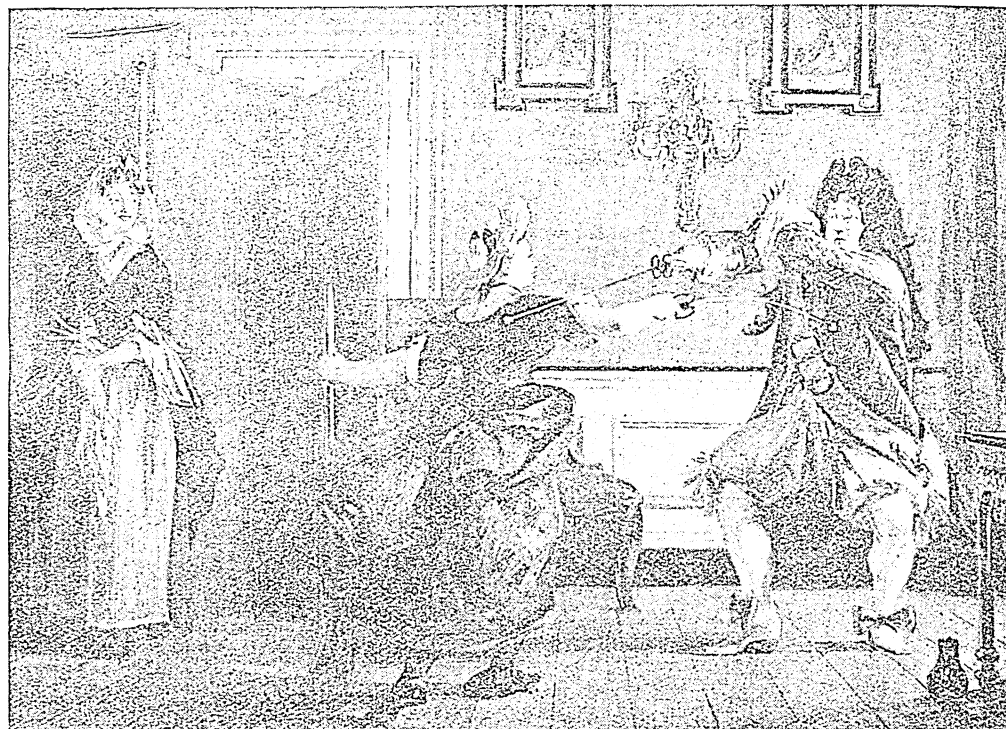
A relief party ultimately found the bodies and buried them where they lay, but afterwards another party was sent up to bring them to Melbourne, and it was thus that the two poor skeletons were being carried through Adelaide as Stuart returned from his triumphant march.

AUSTRALIA'S GREAT DEBT TO THE MEN WHO RISKED THEIR ALL

From then till now the tale of Australian exploration has been one luminous chapter of heroic achievement.

Australia will one day have an immense and prosperous population because men such as we have been considering did not consider the risk of their happiness, or their very existence, too high a price to pay for the knowledge they handed on to posterity.

A READY-MADE GENTLEMAN AT HOME

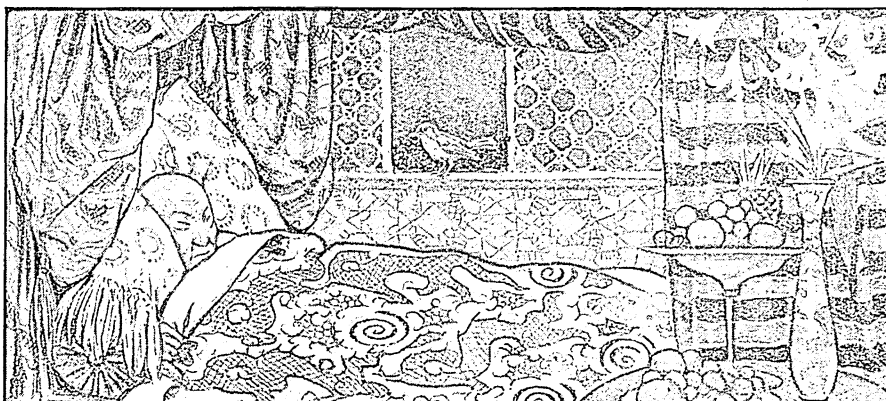


AN AMUSING PICTURE OF MR. JOURDAIN SHOWING HIS WIFE HOW TO FENCE—FROM THE PAINTING BY CHARLES R. LESLIE See story on page 6079



MR. JOURDAIN IS INTRODUCED TO A NOBLE LADY—FROM THE PAINTING BY W. P. FRITH
The lower picture is reproduced by courtesy of the Corporation of Preston

The Great Stories of the World That Will Be Told for Ever



THE EMPEROR'S NIGHTINGALE

THE palace of the Emperor of China was the most magnificent in the world. It was made entirely of fine porcelain, extremely costly, but at the same time so brittle that it was dangerous even to touch it. The emperor's garden extended so far that even the gardener did not know the end of it.

Whoever walked beyond it, however, came to a beautiful wood with very high trees, and beyond that to a lake. The wood went quite down to the lake, which was very deep and blue; and among the branches dwelled a nightingale, who sang so sweetly that even the poor fisherman, who had so much else to do when he came out at night time to cast his nets, would stand still and listen to her song.

Travellers came from all parts of the world to the emperor's city; and they admired the city, the palace, and the garden; but if they heard the nightingale they said: "This is best of all." And they talked about her after they went home, and learned men wrote most beautiful verses about the nightingale of the wood near the lake.

These books went round the world, and one of them at last happened to reach the emperor.

"What in the world is this?" said he. "The nightingale! I do not know

it! Can there be such a bird in my garden without my having heard of it?" So he called his gentleman usher.

"There is said to be a very remarkable bird here called the nightingale," said the emperor. "Her song, they say, is worth more than anything else in my dominions. Why has no one told me of her?"

"I have never before heard her mentioned," said the gentleman usher.

"I wish her to come and sing before me this evening," said the emperor. "Seek her!"

But where was she to be found? The gentleman usher ran up one flight of steps, down another, through halls, and through passages; not one of all whom he met had ever seen or heard of the nightingale.

At last he met a poor little girl in the kitchen, who said: "Oh, yes, I know her very well!"

"Little kitchen maiden," said the gentleman usher, "I will procure for you a sure appointment in the kitchen if you will conduct me to the nightingale."

So they went together to the wood where the nightingale used to sing, and half the Court went with them.

The little girl stopped before a tree.

"There she is!" said she, pointing to a little bird up in the branches.

STORIES

"Most excellent nightingale!" said the gentleman usher, "I have the honour to invite you to a Court festival which is to take place this evening, when his Imperial Majesty will doubtless be enchanted with your delightful song."

"My song would sound far better among the green trees," said the nightingale. However, she followed willingly when she heard the emperor wished it.

At the palace she sang so sweetly that she touched the hearts of all who heard her; and the emperor was so delighted that he said: "The nightingale shall have my golden slippers and wear them round her neck."

But the nightingale said: "I have seen tears in the emperor's eyes. That is the greatest reward I can have."

Yes, indeed, the nightingale's success was complete. She was now to remain at Court and to have her own cage, and all the city talked of the wonderful bird.

One day a large parcel arrived directed to the emperor.

Inside was a little piece of mechanism, lying in a box—an artificial nightingale, which was intended to look like the living one, but was covered with diamonds, rubies, and sapphires. When this artificial bird had been wound up it could sing one of the tunes that the real nightingale sang; and its tail, glittering with silver and gold, went up and down all the time. A little band was fastened round its neck, on which was written: The Nightingale of the Emperor of China is poor compared with that of the Emperor of Japan."

"That is famous!" said everyone; and he who had brought the bird obtained the title of Chief Imperial Nightingale Bringer. "Now they shall sing together; we will have a duet."

And so they had to sing together: but it did not succeed, for the real nightingale sang in her own way, and the artificial bird produced its tones by wheels.

"It is not his fault," said the artist; "he keeps exact time, and sings quite according to method."

So the artificial bird had now to sing alone. He was quite as successful as the real nightingale, and then he was so much prettier to look at; his plumage sparkled with jewels, silver, and gold.

Three and thirty times he sang one and the same tune, and yet he was not weary; everyone would willingly have heard him again. However, the emperor

now wished the real nightingale to sing something. But where was she? Nobody had noticed that she had flown out of the open window, flown away to her own green wood.

"What is the meaning of this?" said the emperor; and all the courtiers abused the nightingale, and called her a most ungrateful creature. "We have the best bird, at all events," said they. And for the four-and-thirtieth time they heard the same tune; but still they did not quite know it.

The real nightingale was banished from the empire; but the artificial bird had its place on a silken cushion close to the emperor's bed.

Thus it went on for a whole year. But one evening, when the bird was in full voice, and the emperor lay in bed and listened, there was suddenly a noise—"bang!"—inside the bird, and the music stopped.

The emperor jumped quickly out of bed, and had his chief physician called. But of what use could he be? Then a clockmaker was fetched, and at last, after a great deal of consultation, the bird in some measure was put to rights again; but the clockmaker said he must be spared much singing, for the pegs were almost worn out, and it was impossible to renew them. So now the bird was allowed to sing only once a year.

When five years were passed away, a great affliction visited the whole empire. The emperor was ill.

Stiff and pale he lay in his splendid bed with the long velvet curtains and heavy gold tassels. Death sat at the emperor's bedside, and the emperor was afraid. A window was opened above, and the Moon shone down on the emperor and the artificial bird.

"Music, music!" cried the emperor. "Thou dear little artificial bird, sing, I pray thee, sing!"

But the bird was silent; there was no one there to wind him up, and so he could not sing.

But suddenly the room became filled with such beautiful sounds that Death could not stay. The music of the real living nightingale could vanquish Death, who, like a cold, white shadow, flew out of the window.

"Thanks, thanks!" said the emperor. "Thou heavenly little bird, I know thee well. I have banished thee from my

THE EMPEROR'S NIGHTINGALE

realm, and thou hast brought me back to life. How shall I reward thee?"

"Thou hast already rewarded me," said the nightingale. "I have seen tears in thine eyes, as when I sang to thee for the first time. Those I shall never forget; they are jewels which do so much good to a minstrel's heart. But sleep now, and wake fresh and healthy. I will sing thee to sleep."

And she sang, and the emperor fell into a sweet and healing sleep.

THE RACE WITH THE WOLVES

ONE still night in the depth of winter a Russian baron set out from the little frontier town of Rob-rin.

The snow lay knee-deep in the streets, and was still falling as the baron, with his wife and child and his servant Eric, got into the sledge and started on the next stage of his journey home to Petrograd.

The landlord of the inn begged him not to attempt to travel that night, as the roads were full of snowdrifts and packs of hungry wolves were known to be in the neighbourhood. But the baron was anxious to get on to the next town, called Bolisov, and the order was given to start.

About an hour after, as they approached a great forest, the baron's wife suddenly exclaimed: "Hark! What was that?"

In the distance came a long, melancholy wailing that rose and fell on the still night air. There was no mistaking that sound: it was the howling of a pack of wolves.

The baron and his servant got ready their pistols; and none too soon, for, looking back, they saw grey, shadowy forms coming across the snow. Faster and faster flew the horses, straining at the harness and rocking the sledge violently from side to side.

But the wolves drew steadily nearer. There were a large number of them, led by an enormous old wolf, which, as soon as he got alongside, tried to spring upon one of the horses. Bang went Eric's pistol, and the wolf sprang into the air and fell down dead. At this the others fell back for a few moments, but they were soon again in full pursuit. This time the baron and Eric fired together, and four wolves fell dead in the snow. The rest of the pack paused for a moment hastily to devour the fallen wolves, but they, too, were soon again in full pursuit.

"There is no help for it. We must turn one of the horses loose," cried Eric, desperately. "Cut the traces!"

When all the people knew that their emperor was whole again their joy knew no bounds, and the little nightingale was more popular than anyone in the land.

The emperor begged her to stay with him and live in the palace, but to this she would not consent.

"I must be free," said she. "But in the evening, when you are alone, I will come and sit by your window and sing to you of the good and evil of the world, and fill your mind with helpful thoughts."

This was done, and one of the leaders dashed aside into the forest with the whole pack of wolves after him.

"We are saved!" cried the baron.

But his servant Eric knew only too well that the hungry animals would soon come on again. Sure enough they did, and then another horse had to be sacrificed.

The carriage was now within two miles of Bolisov, and the lights of the outlying houses could be seen in the distance. The party in the carriage thought they were saved; but as they galloped along it became evident that the horses were tired out and were slackening speed, while the wolves were once more rapidly overtaking the party. Then it was that the servant proved himself a hero.

"I will get down, Baron, and keep the wolves at bay while you, with your wife and child, get away to the town. If we stay together we shall all perish. But perhaps I may manage to keep the wolves off till you return with help."

The baron could not bear the thought of losing his faithful servant in this way, but Eric was determined to risk his life to save his master. The wolves were now on both sides of the carriage.

"Now God be with you all!" cried Eric. "Fire as I jump out!"

The baron fired, and his faithful servant sprang into the midst of the wolves. The savage animals stopped for a moment with the blaze of the pistols in their eyes. Then came a fearful, savage yell, and Eric fired again at the wolves. Then there was silence as the horses dashed forward.

Eric was never seen again, but his pistols were found lying in the bloodstained snow. A stone cross now stands on the spot, bearing the name of the heroic servant on one side, and on the other the words: "Greater love hath no man than this, that a man lay down his life for his friends."

LYAM O'LANNICHAN

LYAM O'LANNICHAN was King of Ireland. At least, so Terence Shaughrowan always insisted, and Lyam had the most implicit belief in all that Terence said.

Terence Shaughrowan, poorly fed and ragged himself, seemed to find a subtle pleasure in bestowing royal honours on his half-starved old horse; so Lyam O'Lannichan bore his rank patiently, in tender resignation, as he bore hunger and cold, as he would have borne death itself so long as he was with Terence.

A queer fellow this same Terence, with a shyness that bordered on sheer stupidity, with a dread of his fellow-creatures, and a great gift for handling horses.

They had met in strange circumstances, these two that were more than friends. Lyam O'Lannichan was a mixture of Arab and Kentucky, and had been the show horse of a travelling circus. But a trainer had savagely mishandled him, and after that no one dared approach him. For three weeks they struggled with him, then he turned man-eater. After that he was thrown, the plunging, flaying hoofs were secured, and he was beaten so brutally that he could not rise. The untamed spirit protested, and it took four of them to sit on his head, so determinedly did he seek to destroy himself.

It was then that Lyam O'Lannichan had looked up from his agonised writhings and had seen Terence Shaughrowan watching him. Electric thrills of love and pity had passed between them. At the very moment that the circus people, discomfited and angry, were deciding to shoot him, Terence had offered to buy him, and Lyam O'Lannichan had passed into his hands.

The old horse stood on the headland of Rhos Ghul, his neck bent, his sad, loving, gentle eyes turned out over the sea. The past winter had been hard, but, with that unerring instinct which is given to animals, he sensed that spring was near, and his old heart was glad. With the spring would come the visitors to the big golfing hotel, and Terence and Lyam would earn money in driving them over to the Lagragh for salmon fishing, or to the lakes for trout.

But the spring did not fulfil its promise, and hard times became still harder. The days went swiftly by. Lyam seemed ailing, and Terence would not permit him to work much. For himself, he slaved at anything that offered a day's employment, returning to lead Lyam from his pasturage

on the cliffs to the tumbledown cabin, where he groomed and fed and bedded him, sleeping himself beside him. But whereas the horse was always fed, though often scantily and coarsely, the man was often hungry.

Autumn came in bleakly. The old horse wheezed terribly. Then one morning in early September he strove to rise, failed, tried again, and succeeded, only to stagger miserably and weakly. For one terrible heartbreaking moment Terence Shaughrowan watched him uncomprehendingly, then sprang forward and with difficulty got him down again.

"Lyam! Oh, God in heaven be helping us! Lyam O'Lannichan, what is ut?"

For answer the old horse rolled his glassy eyes, his thin sides heaved. With a heart of agony Terence turned away.

"Be lying there, Lyam!" he whispered gently, and was gone hot-foot to the Big House. Shown into the presence of Himself, all his agony, his love, and bitter fears broke loose. It was very rambling and incoherent, that poor little prayer of his, but Himself was blessed with an understanding heart, and his hand was on the bell before Terence had finished.

"Send a cart to Shaughrowan's, please, and bring his horse here. It's ill, so be gentle with it," he told the servant; then turned back to the anguished man before him. "Rest easy, Terence," he said. "If it's humanly possible we'll save Lyam O'Lannichan for you."

"And ye'll let it be as I said? Ye'll let me be coming up every day while he's here, and doing the hardest, muckiest day's work there is to be repaying ye?"

Himself studied the expressive face of the man before him. His own great pride was that which is born of pure blood and great ancestry, but in the stupid, ignorant village "doolally" he recognised an honour as great as his own.

"Why, yes, Terence!" he said at last. "It shall be as you say. But you must eat here with the other men."

So Lyam O'Lannichan became a pampered guest in the almost deserted stables of Himself, for here, as elsewhere, the motor had ousted the saddle and carriage horse. It was a non-hunting country, and only a few heavy shires were kept for the necessary carting work on the estate. Terence came every day, and faithfully fulfilled his share of the bargain, working hard and heavily. But always when he

LYAM O'LANNICHAN

went the stableman had to lock the door on Lyam O'Lannichan, and keep him prisoner till Terence came next morning. The veterinary surgeon came every day; Lyam bloomed magically. The thin sides rounded, the brown, faithful eyes lost their pathos and flashed vividly. Terence Shaughrowan exulted daily; the veterinary surgeon listened and made brief reply:

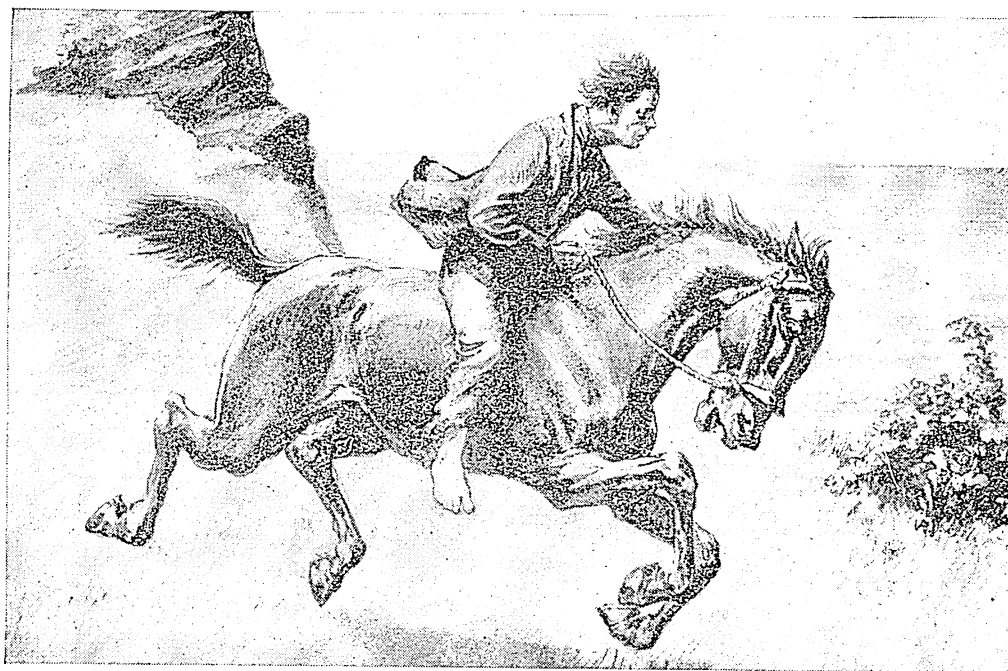
"Yes, Shaughrowan, he looks magnificent. But he's old!"

But of all the intentional significance of that reply Terence realised nothing.

October came; the hotel was practically deserted. Only a few of the visitors

his passionate gratitude on the horse's behalf Terence never guessed that one reason for Himself's determination was because master as well as horse was regularly fed under this arrangement.

The November twilight comes very suddenly and rawly when the wind is blowing off the western seas. Terence finished his last task, bade his loving good-night to Lyam O'Lannichan, and passed through the stable door, which Sam was holding open impatiently. A brief good-night passed between the two men, then, as Terence plunged into the gathering gloom, Sam banged the door and, with chilled



TERENCE AND LYAM O'LANNICHAN RACE TO THE COASTGUARD STATION

remained, Nature enthusiasts mainly; among them Adolphus Byrne, an American visitor, and his daughter, who was painting several views of the coast, and wanted to finish them all. Also she had conceived the idea of painting a sketch of Rhos Ghul in a November storm. Occasionally Terence met her; once he shyly offered to carry her things to the spot she had chosen. The bluntness of his refusal to accept payment was almost brutal, his departure hasty to the point of uncouthness. She looked after the disappearing shabby little figure with a very understanding smile.

November swept in bleak and cold. Himself insisted that Lyam O'Lannichan should remain throughout the winter. In

fingers, turned the key. As always, Lyam O'Lannichan listened to the departing footsteps resting his forehead against the door. Suddenly it yielded. It had not been quite closed when Sam turned the key. He was free. For a second he hesitated; then he was off, his flying hoofs making no sound on the sandy drive.

Terence Shaughrowan, lonely and very tired, his heart sore for the companionship of his beloved Lyam O'Lannichan, heard upon the cliff top behind him the muffled pounding of a galloping horse, and turned.

"Oh, Lyam, have ye been missing me as I've been missing ye? Oh, me kingly love, it's our own hearth-fire we'll share again this night!"

Man and horse walked home together, and again the old routine of loving service was performed, again they lay close together in the fading glow of the falling fire. When Terence awoke it was eight o'clock. He rose in haste, and dressed; then, because he had nothing with which to feed Lyam O'Lannichan, he went out and cut armfuls of the sweetest herbage he could find.

It was ten o'clock when at last they left the cabin together and struck over the dunes to the cliff-path, where the mossy grass would be softer for old hoofs and bare feet than the flinty highway. For a moment they paused as Terence looked with passionate wonder at the ever-recurrent miracle of the incoming tide, now almost at the full. As they turned to go Lyam O'Lannichan pricked his ears, and, straining at his bridle, refused to move. The man gazed at him wonderingly.

"Come on, Lyam!" he pleaded. "Shure, an' what's afther bothering ye?"

But Lyam O'Lannichan declined to stir, and turned his head toward the cliff top. A faint cry caught Terence's ears, and he leaned out over the edge. Far below, on a little ledge, just out of reach of the water, a woman lay. It was impossible to climb down to her from the top. In ten minutes the sea would reach the ledge, in half an hour it would cover it. Terence leaned over and made a cup of his hands.

"Ye'd better be standing up and clinging tight. The sea will be afther floating ye off if ye lie there."

Faintly the answer came up to him. He could not hear it all, but he caught the words "Can't stand!" and "Hurt!"

For a moment he tried to find some way of reaching her. The girl shouted again. The evident pain in her voice pierced him keenly. He recognised her as Miss Byrne.

"Be waiting!" he called. "I'll be getting a boat soon!"

He turned. The nearest boats were at the coastguard station. The girl was safe for an hour, no more, and a boat would take at least forty-five minutes to reach her, besides the delay of getting it launched. Oh, he could never reach the station in time! He started to run, and stopped suddenly. For the first time in Terence's ownership of him Lyam O'Lannichan was mounted.

"It's for a life, Lyam O'Lannichan!" Terence sobbed. "Ye'll not let her be drowned? Oh, you king—gallop!"

Lyam O'Lannichan swept forward. He was old; the first quarter of a mile told him that; but all the splendid pride of his Kentucky sire, and the fierce, devoted loyalty of his Arab dam, awoke in his heart and spurred the flagging limbs.

He scarcely knew how the last stretch was accomplished. Suddenly he realised that he had been checked, that Terence had slid hastily from his back, and was pouring out excited commands to the coastguard. A strange, sick dizziness swept over him; as in a dream he saw the rush of men to the boat, heard the grating of its keel on the runway.

And then, his message delivered, Terence turned to Lyam.

The old horse's eyes were bloodshot and wild, and blood flecked the foam that dripped from his panting jaws. His flanks were heaving terribly, the beautiful limbs shaking, but he met Terence's gaze with a look of such utter devotion as might well break one's heart. Then, even as Terence darted forward, he collapsed and fell.

Presently a numbness crept over him; he could hear Terence's sobs, his lamentations and prayers, but they came from far away. He heard other voices too, and realised that someone was trying to comfort Terence. Then there came the rhythmic throb of an engine, and a motor-cycle was driven recklessly up the last steep hill that had broken his heart.

Some man's voice attempted to gain Terence's attention, but was stilled by the agony of the youth's grief as he prayed Lyam to live. For a brief space there was silence, and Lyam O'Lannichan felt himself slipping farther away.

All his love and pride and exceeding great grief at the parting that he knew was coming found expression in his faithful old eyes as they rested on Terence. With a last flicker of strength he snuggled his velvet muzzle into the lad's hand and whinnied faintly. With a passion of tears the boy flung himself upon him; then Lyam O'Lannichan's freed spirit galloped away to the pastures where hunger and cold and weariness are not known.

And as it went it took for ever all anxiety and hunger from the life of the bereaved boy whom he had loved so greatly, for Adolphus Byrne, standing mutely by, had thought of his own great stables and magnificent animals, and had seen a safe and happy future for Terence Shaughrowan, the lover of horses.

THE READY MADE GENTLEMAN

Mr. Jourdain is one of the characters of the great French writer Molière in his play of *Le Bourgeois Gentilhomme*, from which this is retold.

MR. JOURDAIN was a squat, short little man. His round head was the shape of a globe, his eyes grey and frank.

But the bright colours of his cheeks and his shortness of breath proved that Mr. Jourdain belonged to that class of men who lead too inactive a life. In fact, for forty years you might have seen Mr. Jourdain behind his counter, busy measuring cloth; or at his desk, reckoning up his expenses and checking big registers. Indeed, during forty long years this business man had not left his shop for a single day.

And now, at fifty, Mr. Jourdain had a good little income, and he intended to enjoy it. Enjoying his income meant to him to wear silk and velvet instead of the good cloth he had been selling all his life; he longed to show himself in a gilded coach and "to be among the fine folks."

But Mr. Jourdain was not quite his own master. There was Mrs. Jourdain.

Mrs. Jourdain, a respectable middle-class dame, full of good sense, but a little masterful, was what we call strong-minded. Living in a splendid house, she remained the same Mrs. Jourdain as of old. She did not blush at being greeted by the friends of other days; she gladly remembered them and recalled her working days, and the foolish excuses and stupid pretensions of her husband greatly displeased her—all the more because their daughter Lucile was now old enough to be provided with a worthy husband.

One morning Mr. Jourdain, parading in a sumptuous dressing-gown, awaited his dancing master—for "Is one a man of fashion with no airs and graces?" Another morning he would expect his music master or his fencing master—"For when you are not acquainted with the arts you must learn them." Then he would call in masters of philosophy and literature. He learned that all that was not verse was prose, and what was not prose was verse. "Then I speak in prose all day without any effort?" Mr. Jourdain would say; "how learned I am!"

The tailor was brought in to clothe Mr. Jourdain in sumptuous garb: satin and brocade, feathers and wig—nothing was left out.

"You have gone crazy, my good man," sighed Mrs. Jourdain, "holding a carnival in our house!"

"My dear, you know nothing about elegance," her husband would reply. "Suppose I ask you what are the words you utter?"

"Words of good sense, sir," his wife would say.

"That is not the question. Take the words I speak, if you like: what are they?"

"Nonsense!" said the good wife.

"Oh, dear! You don't understand! The way in which you speak, I speak, is called—what is it called?—*prose*! Prose, my wife!"

Such were the goings-on in Mr. Jourdain's house, a life ridiculous, bringing in due course ridiculous consequences.

One day a neighbour introduced himself and declared to Mr. Jourdain: "I love your daughter. May I have the honour of being accepted as your son-in-law?"

To which, of course, Mr. Jourdain immediately replied: "Only one word, sir: do you go to the Court?"

"Bless you, sir," said Cléonte, "I am the son of good people who have left me enough money to figure at the Court, but, to tell the truth, I am not a nobleman."

"Then let us be friends," said Mr. Jourdain, "but you will not be my son-in-law."

Now Cléonte and Lucile loved each other, and Mrs. Jourdain approved of the young man. How could Mr. Jourdain be persuaded? They talked over many plans, and at last resolved upon an innocent and gentle trick, in which the mania of our would-be nobleman would serve the cause of reasonable folk.

"Trust me, sir," Cléonte's faithful man, Covielle, had declared, full of sympathy for his master's disappointment. "Trust me. That man is mad. He likes to make himself a laughing-stock. Let us foster his inclination. Let us encourage him in his foolishness. We will play our parts. Costumes and actors are easy to find. Ah! you were honest enough to tell Mr. Jourdain of your condition. Well, I am certain that he will now believe you are the son of the Grand Turk!"

Thus it came about one day that Mr. Jourdain found himself face to face with a Cléonte so cleverly disguised as a Turkish prince that the foolish man did not know him, and greatly honoured so illustrious a visitor. Covielle played the part of a disguised interpreter.

"Sir," Covielle began, "I have the honour of introducing to you the son of the

STORIES

Grand Turk. The prince wishes me to say that he knew your father, who was a gentleman of the best blood."

"Ah!" exclaimed the proud peacock Mr. Jourdain, "and would you believe that there are silly people, my own wife among them, who pretend that my father was a merchant!"

"A merchant? Nonsense! It is just this. Your father knew a great deal about cloth, and had a lot sent from all parts. Being most kind, he used to provide his friends with it. That cannot be called business."

"But, sir," Covielle went on, "we have called to tell you the best news in the world. My master, the Grand Turk's son, is in love with your daughter."

"A prince in love with Lucile!"

"Yes, and he wishes to marry her. The prince comes to ask for your daughter in marriage, but in order to have a father-in-law worthy of himself he wishes to make you a mamamouchi."

"Mamamouchi?" burst out the bewildered Mr. Jourdain, overcome with pride.

"Yes, mamamouchi, that is to say, a sort of knight. There is no higher title in all Turkey, and you will rank among the greatest lords in the world."

"All this would be splendid," concluded Mr. Jourdain, "but the difficulty is that

my daughter has fallen in love with a certain Cléonte and will not consent to marry anybody else."

"How do you know?" said Covielle. "She may change her mind at the sight of the prince; he is a fine man."

It is so easy to believe a thing is possible when you wish it to be so that Mr. Jourdain thought to himself: "Of course she may alter her mind. Ah! to be the father-in-law of a prince!"

Mrs. Jourdain and Lucile had not up to now been told of this scheme, and, thinking Mr. Jourdain was going out of his mind, they nearly lost their heads at the sight of this Turkish prince, so that when her father told Lucile what he expected she replied:

"No, no, Father; I will never marry anybody but Cléonte!"

Happily the wise Covielle was there, and whispered a word of warning, so that Lucile could add in time: "However, you are my father, and I must obey you."

"I shall have to give in too," Mrs. Jourdain said, and, being a woman of action, she added: "Let us send for a lawyer at once, and let the marriage be performed today lest the prince change his mind!"

And so Lucile married Cléonte, and we may hope that they lived happy ever after.

THE TREASURE AND WHERE IT LAY

LITTLE JORIS was the son of a poor widow who lived in a small cottage on the edge of a great forest. He had no brothers or sisters to speak to—only the trees and flowers and birds.

When the cold days of winter began, and oatmeal and flour became dearer and dearer to buy, Joris thought he would like to go into the woods and try to find a great treasure, so that he could give it to his mother. If only he could meet a gnome or a fairy, and explain how hard it was for his poor mother to find food! Ah, that would be fine!

So the very next time he was sent out to gather fuel for the fire he went deeper into the wood than he had ever done before. He was not a bit frightened. He talked all the time. "Hullo, tree," he would say, "how old are you? Do you know where the treasure is?" Or he would part the long grass where a little wood violet lay hid, and say, "Ah, you thought I didn't see you!"

So he wandered on and on until suddenly he caught sight of a little man with a long

red cowl on his head, looking round the stalk of a very large mushroom.

"Can you tell me where I can find a treasure for my mother, please?" cried Joris. "She is very poor, and—"

"A treasure! Ha, ha!" laughed the little man. "Why, your mother has a treasure already!" And he vanished quickly between the tall reeds that lined the banks of the little stream.

Poor Joris was very puzzled indeed. Why had his mother not told him of this treasure? The little man must certainly be mistaken.

Joris turned sadly homeward, and, following the stream, found his way safely back to the cottage door.

His mother ran out to meet him.

"Where have you been, my darling?" she cried, putting her arms round his neck. "I was so afraid you were lost."

Joris told his mother all about his wanderings, and what the little man had said.

"He was quite right, my dear son," said his mother, hugging him closer to her bosom. "You are my treasure."

LE LOUP DANS LA NUIT

This is a French translation of the story told in English on page 5958

IL Y A près de cent ans un avocat français, le Baron de Monthyon, légua une grosse somme d'argent pour la fondation d'un prix annuel à donner "à la personne, en France, qui pendant l'année aurait commis les actions les plus vertueuses."

La liste de ces prix constitue une série merveilleuse de nobles actes; mais il est douteux qu'elle contienne une histoire plus héroïque que celle de Madeleine Saunier, une jeune fille, dont l'âme était toute de charité, et qui s'appliqua à aider autrui d'une façon admirable.

Une pauvre veuve aveugle habitait, avec sa fille souffrante, à trois kilomètres de sa demeure, et pendant quinze ans Madeleine ne manqua jamais d'aller, à pied, chez elles, de les nourrir, de mettre leur maison en ordre, et de leur donner de la joie; elles attendaient impatiemment son retour le lendemain.

À une distance égale, mais dans une autre direction, vivait, dans une maisonnette isolée, une pauvre fille atteinte de la lèpre, et abandonnée de ses amis. Pendant dix-huit mois Madeleine la visita deux fois par jour, pour lui donner le peu de nourriture qu'elle pouvait manger et pour panser ses plaies atroces, jusqu'au jour où la pauvre lépreuse mourut entre ses bras.

En 1840 Madeleine fut presque noyée en tâchant de traverser une rivière grossie par les pluies, qui la séparait d'une personne qu'elle visitait journellement, et quand on lui reprocha sa témérité, elle répondit simplement: "Je n'ai pas pu m'en empêcher; ne pouvant aller la visiter hier, j'ai senti que je devais aller la voir aujourd'hui."

Pendant un rigoureux hiver elle eut une dangereuse aventure. Elle soignait une mourante, appelée Mancel, qui habitait au flanc d'une colline dans une cabane qui ressemblait davantage à la tanière d'une bête sauvage qu'à la demeure d'un être humain.

Vers la fin d'une longue nuit, Madeleine avait allumé quelques brindilles vertes, pour essayer de remédier au froid intense, lorsque la porte verrouillée fut poussée du dehors, et elle vit un loup prêt à bondir dans la chambre.

Elle sauta contre la porte et la tint solidement, s'aidant de tout ce qu'elle pouvait atteindre pour la maintenir fermée, tandis que l'animal se ruait contre les planches. Et elle criait de toutes ses forces, dans l'espoir d'éloigner le loup en l'effrayant. Mais durant tout le reste de cette nuit terrible elle eut à maintenir la porte contre lui.

THE BOY WHO SAVED A CREW

IN the year 1798, during a terrific storm, a French ship, La Tribune, was wrecked one evening off Halifax, Nova Scotia, and a number of men belonging to the crew managed to climb into the rigging, where they remained all night, the people on shore being powerless to assist them in the raging tempest.

When daylight dawned the poor men were still in the rigging, almost exhausted by their terrible experiences of the night. The sea, however, was still rising in angry waves, and beating like a torrent upon the wreckage and the shore, so that none of the strong men on the beach dared venture out to rescue the shipwrecked mariners.

It was then that a deed of amazing courage and splendid heroism was performed by a boy of thirteen, whose name, unfortunately, we do not know.

This lad had been watching the wreck for hours and listening to the talk of the spectators, expecting that some of them would, at any rate, make an effort to save

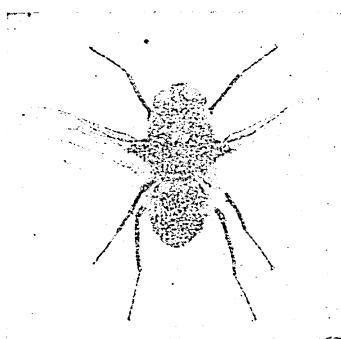
the wrecked sailors. When at last he found that no one dared to make the attempt he determined to see what he himself could do to reach the vessel.

Jumping into a small boat, he rowed with all his might for the wreck, and, though the wind and the waves were almost too strong for him, he managed at last to reach the ship and get his little boat near enough to take off two of the men. They were too exhausted to assist in rowing to the shore, but the plucky boy, by great exertions, landed them safely.

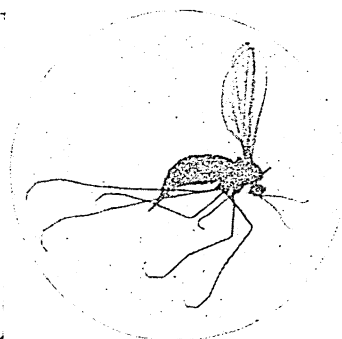
Then he started for the wreck once more. But his strength was exhausted and he was unable to battle with the wind and waves, and had to return to the shore, to his intense grief and disappointment.

The brave example set by so young a lad, however, bore good fruit, for the men were shamed into making an effort, and several boats went out to the wreck, finally saving every one of the men who had taken refuge in the rigging.

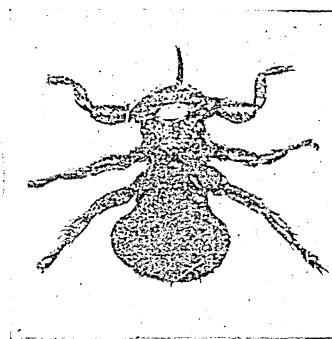
A SWARM OF FLIES



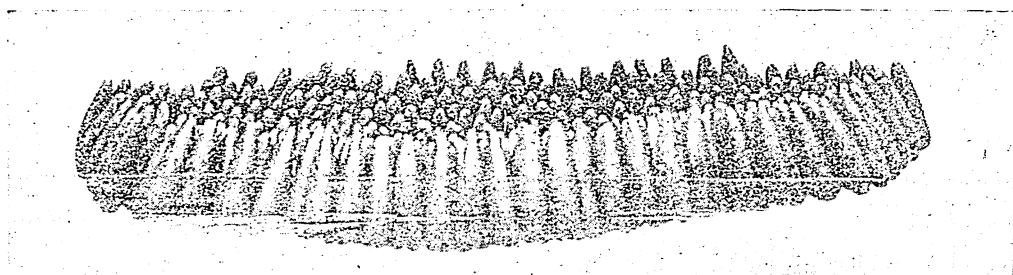
WARBLE-FLY



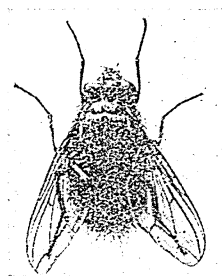
HESSIAN-FLY



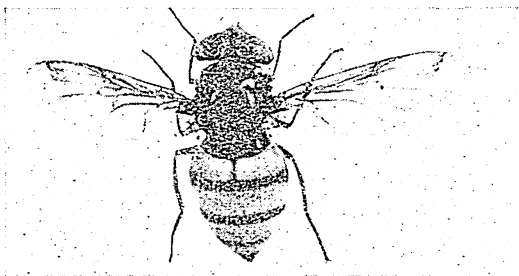
THE SHEEP KED, A WINGLESS FLY



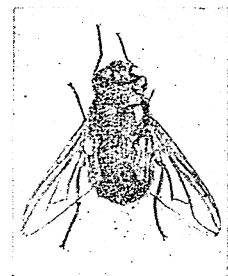
AN EGG RAFT OF THE COMMON GREY GNAT



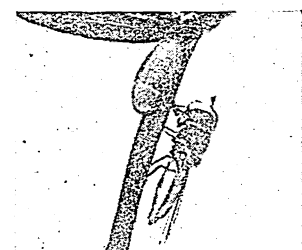
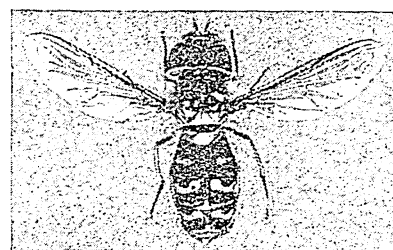
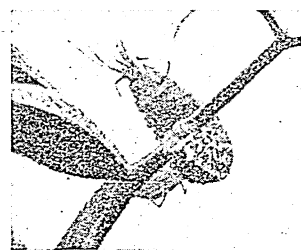
BLUEBOTTLE-FLY



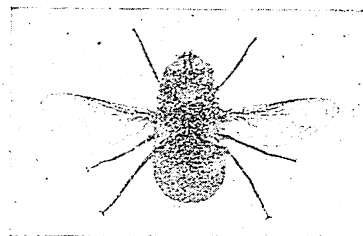
GIRDLED DRONE-FLY



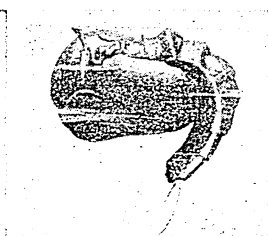
NOONTIDE-FLY



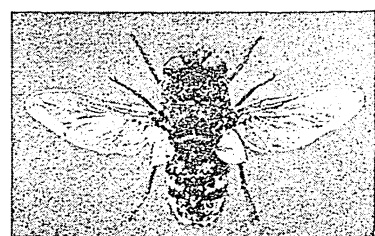
THE HOVER-FLY GRUB, THE FLY, AND A HOVER-FLY JUST EMERGED FROM ITS CHRYSALIS



HORSE BOT-FLY



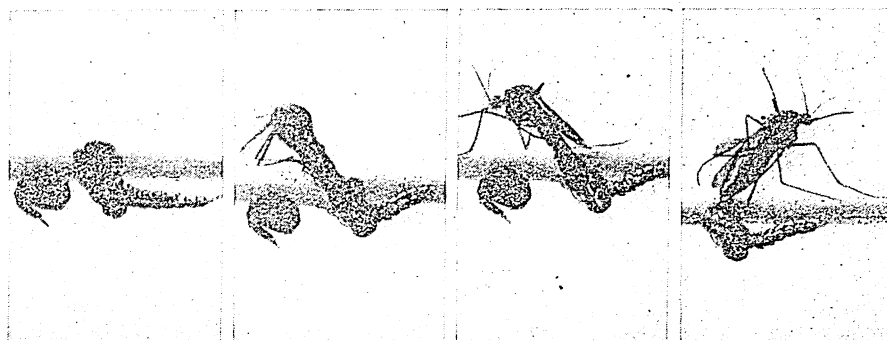
SPOTTED MOSQUITO CHRYSALIS



NASAL BOT-FLY

The pictures on these pages are by Mrs. M. H. Crawford, Messrs. Collins, Ward, and others

Nature's Wonderful Living Family in Earth and Air and Sea



A gnat emerging from its cocoon

GNATS AND FLIES

PEOPLE often ask why such pests as flies and mosquitoes were made, and expect that in some way these insects can be caused to justify themselves or plead guilty to their misdoings.

But Nature never apologises, is never penitent, never pitiful to the incompetent. Her ancient plan was to endow various Orders in various ways. She has expended the nicest care over the equipment of a mosquito which carries the seeds of death into human blood, but she has fostered in the human skull a brain which, rightly directed, enables us to avert this peril that flies by night.

Not all mosquitoes are deadly. We have many British species which inject a mild poison into our blood to inflame but not to destroy. The mosquito which does kill is only the medium, not the cause. It is itself the victim of a parasite, and that parasite is the instrument of destruction.

The insects of which we go most in fear are taskmasters without mercy, but by attention to hygiene, by the employment of specifics against infection, we can make our lives secure and sweet at home, and little by little, as civilisation advances, we shall carry the same methods into the wilds, and make them also safe for human life.

Ice and snow, chilling rains, and bitter winds were in the world when we came into it, to deprive us of life; fire and

flood, raging torrents, and deep swift seas were there to burn or drown us. We descend from ancestors who learned to bridle, to circumvent, these lawless forces and reduce them to our service. The insect problem is not more difficult, though not less deadly.

We can track the death-dealing mosquito and defy its ravages, and, taking the malarial enemy captive, now make it bite to our advantage. For one of the newest marvels of science is that inoculation, in a mild form, by the malaria-carrying mosquito is a cure for general paralysis of the insane.

Not all mosquitoes are ministers of death. Unless they are themselves infected they cannot transmit disease to us. The germs of malaria and of yellow fever, of which mosquitoes are the carriers, are parasites which pass one stage of their lives in the blood and stomach of the mosquito, and the other stage in the blood of man or other mammal.

We cannot suppose that gnats thrive on their infection. They would be better without it. They themselves are victims, and victimise us in turn if we come within their orbit. As a fact we have more than one species of the *Anopheles* mosquitoes, the malarial ones, in Great Britain, but they are entirely harmless, save for their irritating bites, unless a

person or animal affected with malaria chances to be bitten by them.

If that happens then the parasite passes from the blood of the man into the body of the gnat, multiplies there, and is passed on into the system of the next person bitten. That man thus becomes a carrier of the affliction and can infect numerous other mosquitoes, all of which, when they drink their succeeding meals of blood from new human victims, continue to spread the disease.

A NEW DANGER BROUGHT TO BRITAIN BY MEN FROM THE WAR

There lies the danger in Britain. Since the war very many men have brought home the organism of malaria in their blood. These men, visited by the Anopheles mosquitoes, pass on their living poison to the insects, and set up new waves of danger for the rest of us.

Years must pass before the danger is averted. It has been conquered in the past and will be again. We read hundreds of references to ague in the history of what we call Merrie England. That ague was malaria. Almost unconsciously we defeated the dreadful malady by the cultivation of the soil. We drained fen and bog and marsh, and turned them into fields and gardens and towns. At each intake of such reclaimed lands we dried up the source of the mosquito life.

Malaria itself tells the tale of the old belief as to the disease which it describes. Men thought that marsh air was ill to breathe, and that it was this air which brought malaria. The word malaria means simply bad air; as a fact, however, air had nothing to do with the matter.

CLEANLINESS AS THE GREAT ENEMY OF DISEASE

It was the water, the marshes, the sodden banks of rivers and lakes, the puddles and muddy pools of filthy cities and villages, that were the breeding places of the fatal gnats. Malaria and mosquitoes vanished together from a district when cleanliness took the place of neglect, and bog was converted into dry land. Apparently the supply of malarial parasites died out in our midst in face of this campaign, for the malarial gnats that we now have are, if uninfected from external sources, as innocent, though as irritating, as the black midges which torment us with their poisoned bites on the damp tennis lawn and on the rivers where we float and loll.

The tracking down of the germs of malaria and yellow fever is a triumph of our own time and the achievement of our own heroes of science, a dazzling story, of which we have read in other pages.

The building of the Panama Canal was one of the grandest engineering achievements the world has seen, but the conquest of the little mosquito which had so long kept it back was a performance of even greater significance. That conquest has its echo in every tropical land to which civilisation spreads. Beat the mosquito by cleanliness and common prudence, and the tropics become health resorts, where formerly a white man was doomed.

What did the mosquitoes do for their blood supply before man appeared among them as a reservoir? They lived, we suppose, on vegetable juices. The deduction is based on the fact that mosquitoes deadly to man and animal teem in billions in great areas of tropical country where man has never yet established himself, and where big mammals have not gained a foothold.

THE CHILDREN OF NATURE WHO SEEM TO HAVE TAKEN THE WRONG TURNING

If the dreaded gnats are vegetarians there today they must always have been, and it is reasonable to assume that the same rule governed the attitude and appetite of the ancient mosquito. Another line of inquiry has led science to the belief that the bacteria now so deadly to other forms of life were once equally innocuous, and lived lives of innocence, guiltless of their fellow creatures' blood.

If this be granted, then how nonsensical it is to charge Nature with the guilt of her insect children. They do ill where we permit their existence, but they are simply fresh examples of groups of life which have taken what seems to us the wrong turning, like the kea parrot which has become a murderer of sheep, and the gull which has turned inland from the stormy sea to garner into its crop the grain that man hoped to harvest for himself.

We invite disaster at the instance of this great order of two-winged insects, the Diptera, as they are called, to which the mosquitoes, midges, and the rest belong. A stride from the mosquito, and we are in the midst of those long, brown-bodied flies with prodigious straggling limbs, flies which we call daddy-longlegs or crane-flies.

They look like mosquitoes as we might see a mosquito under a magnifying lens, but they have none of the sawing and piercing implements of the smaller and more formidable insect. Their mouth parts are framed only for the harmless occupation of sucking up surface moisture. The adult crane-flies are harmless, though the spear-like projection at the rear of the female's body suggests a lusty sting. Indeed, it is but that marvellous contrivance the drill with which she bores, and through which descend the eggs she deposits in the ground.

The mosquito larva is hatched in water and is harmless there; but the baby of daddy-longlegs is hatched in the earth, in the lawns, the pastures, the flower borders. And this does mischief enough to grass, the roots of flowers, and so on, to make up for all the engaging helplessness of the swarming adults, drifting in brown clouds in the air of a summer night.

That we are plagued by these leather-jackets, as the larvae are called, is one of the penalties we pay for the indiscriminate slaughter of rooks, starlings, and other hunters after the leather-jacket.

THE TERRIBLE PROCESSION OF WORMS WHICH EAT THE GROWING CROPS

We cannot always trace cause to effect in the multiplication of our insect foes; as, for example, when enormous hosts of the army worm appear and devour pasture and corn like a moving fire. But, as corn cannot be damaged save where man has sown it, we may be right in assuming that the hand which scattered the grain scattered also the natural foes of the army worm which eats the crop.

The parent of the army worm is a small black fly which lays some hundred eggs in the earth. The larva is a maggot and is about a quarter of an inch long. Normally little groups keep to themselves, but in the great years, when numbers are outrageous, swarms meet swarms. The innumerable larvae form themselves into long columns and march as an army, not all in orderly procession, but when one part of the line halts the others crawl above it, and the sinuous mass winds its slow length along, feeding, fattening, clearing all before it like locusts.

Perhaps because supplies grow short, perhaps because maturity in the larval form is attained, the great mass contracts, thickens, becomes an enormous ball, and disappears slowly into the earth.

Much mystery is made of this vanishing into the ground where mystery does not exist. The underlying strata of army worms excavate and sink the whole mass of life, as a burying beetle sinks the dead bird or mouse on which it intends to live.

A NATURAL EXPLANATION OF AN APPARENT MYSTERY

The obvious reason for this tunnelling and engulfing of the host is that their hour for change into the pupal state has arrived, and the larvae know it as well as a caterpillar instinctively knows when it must spin its cocoon and change.

Leaving the army worms to their crawling, we glance into the air to espy the hateful little midges which bite and cause intense irritation to all, and genuine illness to people who are susceptible to their not very terrible venom. We have not to see them; a good ear catches the high note of their wings and humming as they fly. They are not mosquitoes, though closely related to them; and their bite is never fatal.

It is inflicted by lancet and saw, after which a fluid is injected by the insect to render the blood thinner and capable of being drawn up. The effect of British mosquito and midge is much the same on us in its irritation, but only the mosquito can carry the germ of fever; though the midge bite, when administered by a swarm of insects, can drive away sleep and happiness from all but those fortunate people whose blood is impervious to the effect of the little drop of virus.

HOW THE PLUMED MIDGES PAY FOR THEIR FIERY SPLENDOUR

Midges, which are among the minor inflictions of summer life in the open, have their troubles not less grave than those they inflict. Enormous swarms of plumed midges, like our own kind, have been observed in Russian Asia to be apparently on fire with splendour, luminous and lovely. But this phosphorescent brilliance seems to be the product of harmful bacteria, which so enfeeble the victim that it is reduced to crawling, quite deprived of the power of flight.

Now, are we to assume that such a condition of luminosity can become habitual and harmless in a group? It would almost appear so, for among the fungus midges two or three genera are known in which the power to light a lamp in the living body is accompanied by no more hurt than in the glow-worm. In Europe there is the

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Ceroplatus sesiosides, and in New Zealand, where it is called the glow-worm, the *Boletophila luminosa*; both put forth an astonishing radiance, but to what end we cannot yet say.

To us only the beauty appears, but as the larvae possess the radiance as well as their parents, and employ it as a lure to tempt prey to their gummy webs, there seems to be some such purpose in it as that which lights the lanterns of the deep-sea octopus and those of the great-jawed hungry fishes of the ocean abysses.

THE FILTHY CONDITIONS IN WHICH THE FLIES COME INTO LIFE

There is not much mystery remaining for us in the life history of the flies which haunt our homes, unless it be the mystery as to why we tolerate them. The flies which infest our homes are not born there, but are cradled in corruption and horror, in dunghills, in deadly, disease-breeding dumps.

It is there that the adult female lays her eggs, there that the eggs hatch into the maggots which fishermen use as bait, calling them gentles. Egg, larva, pupa stage, are all passed in these horrid surroundings. The fly bursts from its pupal case, and has to crawl through filth to the daylight. Its feet and its hairy body bring with them crowds of deadly microbes. In they come to the house, straight to the food and milk, to foul them, to cause fatal illness to babies, sickness, and possibly eventual death, to adults.

Practically all the abominations which used to poison the food of our ancestors and make their lives melancholy and brief have been swept away by modern sanitation, yet the fly, deadly as any, is still suffered through ignorance or indifference.

WHY WE MUST ALWAYS KEEP FOOD AWAY FROM FLIES

Professor Maxwell Lefroy, of the Imperial College of Science, has had the patience to work out the life history of the fly as devotedly as the men who lead romantic expeditions into the tropics to study creatures whose mysteries are infested with that glamour and fascination which distance and unfamiliarity impart, and he finds a terrible tale to tell the world of this common foe of our domestic peace and comfort.

The fly carries living corruption about its body; it carries corruption in the food which it has eaten, and, when it meets a more attractive diet, it throws up this

poison on the fresh food in order to fill itself with the more alluring diet. Especially is this the case when it finds a supply of milk. Into it goes the poison which will kill a baby, which, every September, the great fly month of the year, slays infants wholesale in England.

The professor shows that the house-fly keeps the germs of typhoid alive in its body for 28 days, and that for another 23 days after this deadly parasite leaves the body of the insect it retains its life and virulence. In addition, the fly brings into our homes cholera, enteric, dysentery, and, attacking the face, causes ophthalmia, the loathsome affection which mars the beauty and use of myriads of bright eyes in the East. Probably the germs of tubercular consumption also find a carrier in the fly.

Yet this slayer of our children and poisoner of our adults is tolerated. The refuse heaps in which it breeds are permitted to remain uncovered and untreated, at the cost of innumerable little human lives every year.

THE SMALL BLACK HOUSE-FLY WHICH DRAWS ITS VICTIM'S BLOOD

We have more than one species of house-fly. The majority merely moisten and suck; but the little black house-flies draw blood. These are not undersized members of the ordinary fly tribe, but fully developed examples of their kind—for flies are full-sized at birth, and never grow after quitting the chrysalis form. Care and cleanliness will some day banish the fly from our houses, but till then we have a potential minister of death or violent illness in every one that alights on our food.

But all the flies are a problem. There is the bluebottle, which we rather admire because of its breezy, tempestuous dash and hum. Yet it is a horrid creature, depositing its ravenous maggots not merely on meat, but on living flesh, on open wounds, even in the nostrils of sleeping infants and invalids. Civilisation ought not to endure this little monster.

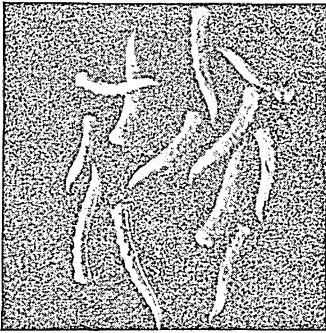
But there are worse flies than ours, as any Italian will tell us who, with natives of other warm countries, has had experience of the sand-fly. It is a minute fly, difficult to discover; but, now that it is known to inject into its victim the bacilli from which pellagra arises, it is one of the most dreaded of insects.

Pellagra is a terrible source of suffering to human beings, ending after many years

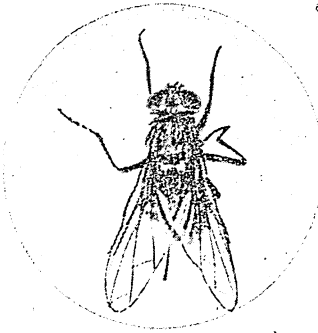
GNATS AND FLIES

in madness and miserable death. Who will rid the world of sand-flies? Within the last two years this insect has been proved even more frightful than was supposed. We had all imagined that the sand-fly, like the mosquito, must be individually infected by bacteria, of the parasites of

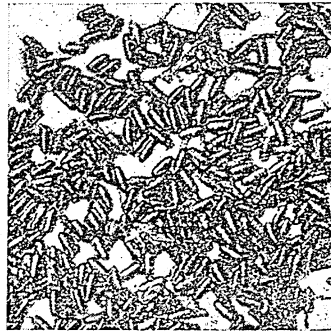
care to London and reared in scrupulously sterilised conditions have been permitted to bite volunteer students, and have set up the fell malady in them for which the breed is infamous. Thus the risk of the spread of pellagra is lamentably greater than any of us had dreamed, possibly not in England,



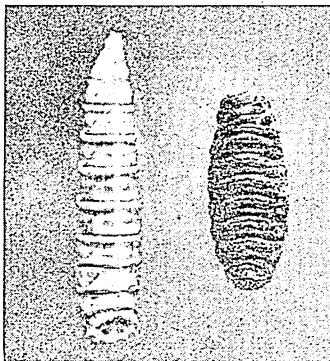
GRUBS OF THE HOUSE FLY



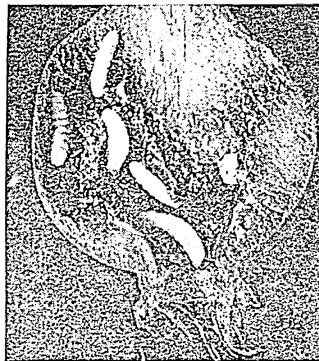
THE HOUSE-FLY



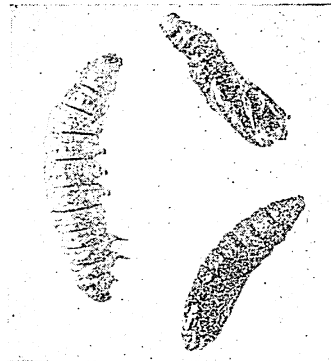
PUPAE OF THE HOUSE-FLY



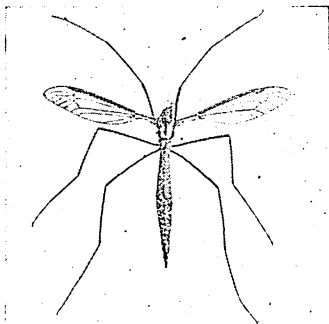
THE GRUB AND PUPA OF THE BLUEBOTTLE-FLY



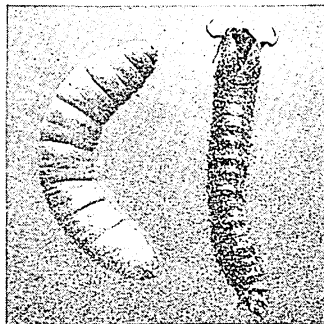
LARVAE OF THE PEAR MIDGE INSIDE A PEAR



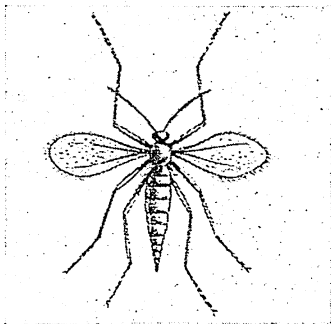
THE MAGGOT, PUPA, AND EMPTY PUPA CASE OF THE APPLE MAGGOT



THE DADDY-LONGLEGS. OR CRANE-FLY



THE GRUB AND PUPA CASE OF THE CRANE-FLY



BRITISH WHEAT MIDGE

which it is the host, before it could cause pellagra in a human being.

Scientists have, however, made the dismal discovery that a sand-fly is born with an inheritance of infection. Sand-flies bred from eggs brought with great

but in warmer lands of the British Empire, especially now that swift aeroplanes course the skies and carry the insects of one place across an ocean to another land.

With ways less terrible to ourselves, but dreadful to animals, there are many

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flies which keep to the open air. Among these are various bot-flies. One of these, the *Gastrophilus equi*, is a plague to horse life. Irritated by the attentions of the fly, the horse licks itself and transfers the larvae to its mouth, whence they are swallowed. The larvae, on hatching, hook themselves to the stomach or intestines of the horse, and there complete their larval growth.

THE HORRID WARBLE-FLY AND THE DISCOMFORT IT CAUSES TO CATTLE

We do not know that the process is injurious to the horse, but it must cause discomfort. There is unfortunately less doubt as to the warble-fly, which cattle fear as we fear angered hornets.

In the blazing heat of a summer afternoon, when the cattle should be chewing the cud in the shade of the trees, we may see them madly rushing about their pastures. The cattle are clumsily seeking to flee from a dreaded enemy.

The fly deposits its eggs on the hide of the animal. There these hatch for the maggots to eat their way into the flesh and cause hideous wounds beneath the skin. As many as 400 of these gnawing parasites have been found beneath the hide of a single cow. The poor animal is miserable; it loses flesh, its milk is insufficient and inferior, and when the end comes, and its hide is to be converted into leather, immense damage is found to have been caused. The British leather trade suffers from this cause a loss of millions of pounds a year, to say nothing of the sufferings that the unfortunate cattle have to endure.

THE DELIBERATE PERSECUTION PRACTISED BY THE FOREST-FLIES

The so-called sheep bot-fly is another horror, which penetrates the flesh of the sheep's nose with disastrous effect. But the name of this fly is too restricted in its implication, for the insect attacks man, birds, frogs, toads, and other amphibians.

We have noted the love of cattle for shade, a passion which horses share, but there are winged enemies for them there too, various species of strange forest-flies. A more deliberate career of persecution than that of the forest-flies could not be imagined. They attack the horse, the cattle, the deer, even birds, and, beginning as winged couriers, bite off their wings when they alight on their prey, just as

queen ants bite off theirs after their marriage flight, and settle down to drink blood drawn from those parts of the flesh least protected by hair.

There are infinitely more terrible forest-flies than these, however, the tsetse-flies which haunt the forests deeply fringing the great waterways of Africa. There are many species of tsetse-flies, some harmful to domestic animals and not to man, others as terrible enemies as human beings have to confront.

These flies are parasitic on the great game of the Dark Continent, and, fashioned to take their blood supply from animals with tough hides such as antelopes and zebras, they are furnished with potent piercing and sucking implements, though in themselves generally resembling in size and outline our own blow-flies.

THE BARRIER OF FLIES THAT KEEPS THE STRANGER OUT

Now, in the blood of the game which these flies attack swarm myriads of low organisms, eel-like in outline, called trypanosomes, which undergo one stage of their growth in the original host, are then sucked up in the blood drawn by the fly, to remain dormant in the interior of the insect and renew growth and attain maturity in the body of the mammal which the tsetse next bites.

The range of the tsetses is widespread, but not continuous. They abound in what are known as fly belts, areas of great size which have their definite, beginnings and endings. Into these belts no domestic animal can penetrate and live. The fly injects its poisonous parasites into horse, ox, donkey, dog, and these sicken and die a horrible death. That disease, peculiar to animals, and not extending to man, is called nagana, and cannot develop in human blood.

That is terrible, and a hindrance to colonisation in the fly-infested country, for we are entirely dependent on animal service in such conditions. But it is from the tsetse-fly that that dread malady, sleeping sickness, is carried to men. The name conveys the character of the ailment, and is not, of course, that of which we hear in England under the name of sleepy sickness.

The actual sleeping sickness is as fatal to white men as nagana is to white men's animals, as terrible in its course, as deadly in its issue. Natives whose ancestry has for generations lived among tsetse-flies

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are as immune as zebras and lions are to nagana ; but when new areas are opened up between tsetse country and non-tsetse country the flies, advancing through the cleared ways, produce frightful havoc among the non-immune natives.

HOW THE RAILWAYS IN AFRICA HAVE HELPED TO SPREAD DISEASE

Possibly no malady has run through Africa with such frightful rapidity as sleeping sickness since railways, during our own lifetime, have created long corridors through forest land along which the disease could be carried ; and there have been times when the black sons of Africa have died from sudden onslaughts of sleeping sickness by the hundred thousand. That is what a puny fly, to whose attacks man is unaccustomed, can do for humanity.

Flies of many species have yet to be studied, and there are a host already described for the student who can seek their story in science manuals ; but we may repeat that not all the flies in our midst are harmful. The bee flies are a boon to us, for whereas the adults restrict themselves to the nectar of flowers which they help to fertilise, their larvae are great devourers of caterpillars and of ground insects which harm our crops. The drone-fly's larvae eat decaying vegetation which makes wayside waters noisome, and also consume carrion when the eggs are laid in the carcase of a dead animal.

The humble-bee flies closely resemble the bees after which they are named, but they puzzle us. Some place their eggs in the nests of honey-bees, some in those of wasps. It is not certain whether the larvae eat the young of the bees and wasps or whether they merely act as scavengers and consume waste matter.

A USEFUL LITTLE ALLY AND ITS FINE POWER OF FLIGHT

The second supposition seems the more probable, for we cannot imagine that creatures so sagacious as bees and wasps would sanction the presence of slaughterers of their larvae.

We are on more certain ground with the hover-flies, and can welcome them with delight unqualified. As they dart and dash among our sunlit flowers, first with the speed of a dragon-fly, then pulling up short as though halted by the most marvellous of brakes, then rising straight on a level keel, next darting sideways, then

backward, then down, fast as the sunbeam they follow, we see the perfection of flight, the ideal at which man aims.

More grace and enterprise in flight, greater suggestion of rapturous enjoyment, no creature shows. We welcome them for their merry grace and avidity, but we accept them as unsworn, uncontracted allies, for their larvae grow up among the rose-gorging green-fly, and devour the vital juices of those hateful parasites with an appetite like that of a hungry donkey introduced to unlimited carrots.

Even if we had no green-fly to ruin our roses we should still retain the hover-fly in our affections for its grace and beauty, but there are some flies which we value for service without regard to their appeal to our sense of the artistic. There is in northern Africa, for example, a fly as much like our house nuisance as the tsetse-fly, the *Idia fasciata*, which is worth far more than its weight in gold. It is to the devouring locust what the monitor lizard is to the crocodile ; it eats the locusts' eggs.

A FLY OF NORTH AFRICA AND ITS SPLENDID WORK FOR MAN

The parent fly has no direct part in the service, except a wonderful instinct for finding where the eggs lie. She is more determined than even the ichneumon, which pierces a tree to lay her eggs, for this little fly burrows down three or more inches into the hard and burning soil to reach the place where the great powerful locust has hidden its store of eggs.

There the *Idia fasciata* lays *her* eggs, and the young ones when hatched live entirely on the locust eggs, which they devour in great quantities. How much they save us by this beneficial destruction of the foes of our crops is not to be estimated, but our debt to them must be very great.

Flies in the past must have rendered great service merely as devourers of carrion and in the destruction of vegetation which would have rankly overgrown the earth. The parasites which they then collected did not matter to us, for we and our animals were not there to be afflicted by them. Now, however, we have overrun their ancient territory, and by our own neglect have conduced to their multiplication, to our serious disadvantage.

We have taken weeds and converted them into cultivated growths indispensable to human life and health. The parasites have come in with the vegetation which we

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have seized and improved. There is not a thing we cultivate which has not its special parasite or parasites, pests which have to be combated as anxiously as frost on summer nights.

There are flies peculiar to celery, to carrots, to onions, to apples, and so forth, all laying eggs from which maggots emerge to devour either the foliage, the fruit, or the root of the growth to which their lives are committed.

PESTS OF THE COUNTRYSIDE AND HOW WE MAY DEFEAT THEM

The number of pests tends to increase as does the number of individuals where neglect makes multiplication easy. There is a treatment for each if we will take the trouble to apply it. A few pence may bring to any of us admirable publications prepared by the greatest living experts, under the direction of the Ministry of Agriculture. It is our own fault if we do not meet these scourges of the fields, pasture, and garden forearmed with the knowledge that may make us triumphant.

Human population is constantly growing; indeed it is slowly outgrowing food supplies, so we shall in time have to fight the insects scientifically or starve. For they are marvellous in their methods of maintaining a hold on life and of extending their sphere. There are flies which do not depend on the hazard of reproduction of separate generations, by successive batches of eggs.

Some are born alive, devouring the body of their mother before entering the world as larvae ready immediately to turn into chrysalises. More wonderful, we have baby flies giving birth to other baby flies. That is to say, the larvae, without ever attaining perfect insect form, produce larvae like themselves.

THE STRANGE CASE OF THE FLIES THAT HAVE LOST THEIR WINGS

The new generation of larvae devour the old larvae of which they are born, and they themselves, remaining babies, become parents, for they also, without growing up, evolve other larvae from their own bodies.

It seems marvellous, but is it primitive, or a tremendous feat of specialisation? Probably it is the first, for we find salmon when not nearly mature becoming parents; we find amphibian larvae becoming parents, and any of us can grow an entire begonia from a single leaf of such a plant.

Yes, the flies can make as great changes, in time, as we can, though there is not a notable brain among the lot of them. The hateful flea is merely a fly of other days. It is one of the two-winged insects which have lost their wings.

Quite recently Dr. Karl Absolon, curator of the Brunn Museum, has found flies in the Balkan caves and underground water-courses which have lost their wings as completely as the fleas. Let us hope that their future may be less disastrous to us than that of the flea.

The subject is so unpleasant as to be banned, with that of other human vermin, in polite society. But we ought to discuss these things so that people may realise that there is as deadly a peril in uncleanness and neglect as in the disregard of precautions in a fever hospital.

For this detestable flea, which has given up its wings in order to batten on the blood of mammals of all sorts, is the demon of the plague tragedy. He it is who carries the fatal germ that has mowed down more millions of human beings in Asia and Europe, England not excepted, than all the wars ever fought. When a plague-stricken rat dies, its fleas leap on a human being, bite him, and he dies of the plague.

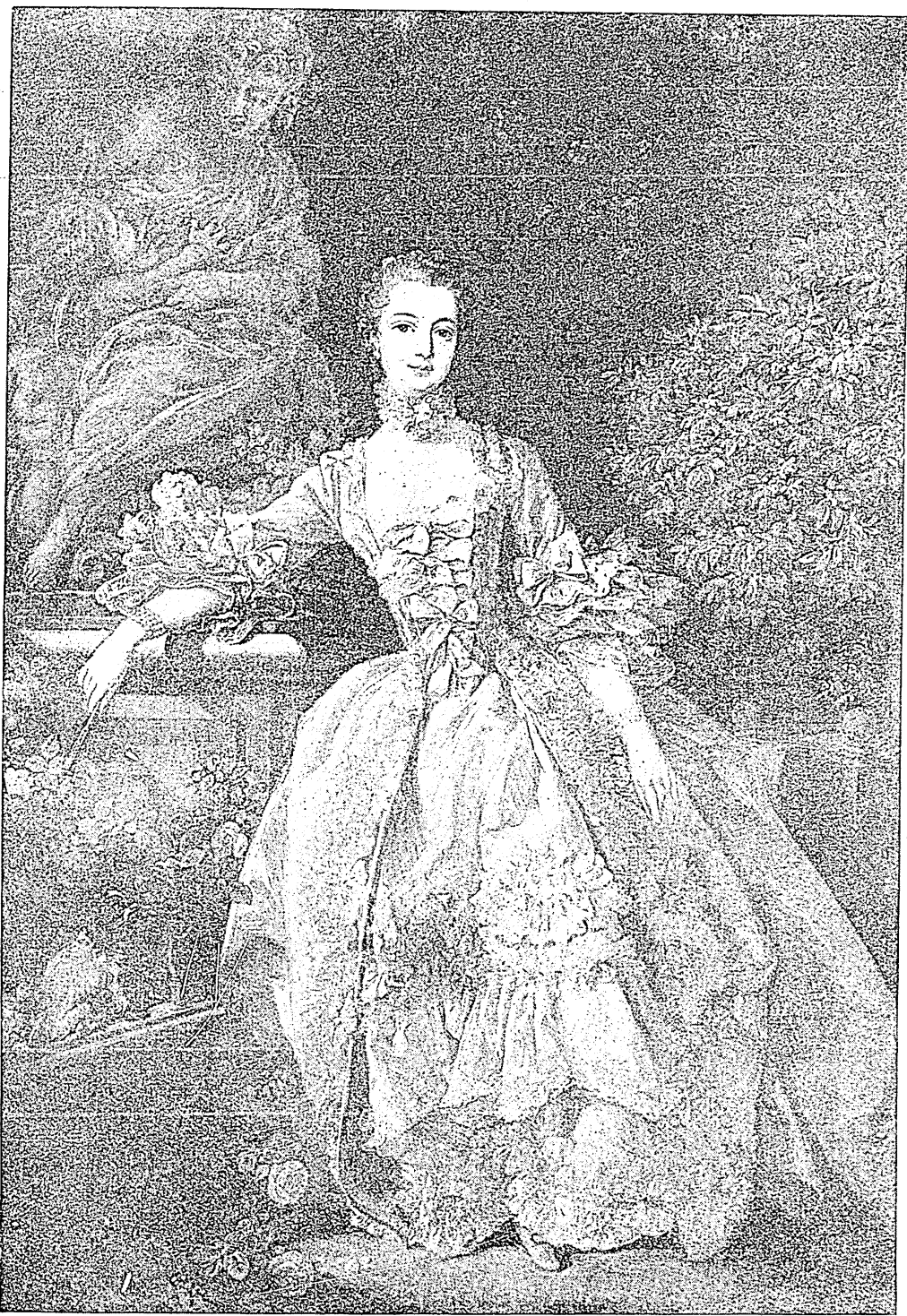
NATURE'S REPROOF OF THOSE WHO DISOBEY HER LAWS

Happily our ports are so well guarded against rats that there is little likelihood of plague returning to the England which it has so often scourged; but we have fleas here to do work almost as fell.

Scarlet fever is always with us; the flea carries the infection. It is now believed to be the bearer also of the parasite from which rheumatic fever results. Plague, scarlet fever, rheumatic fever, are the evil gifts of a fly which has discarded its wings and become a man-infesting flea! If we all practised the cleanly care due from civilised people these deadly complaints would, if not utterly banished, be enormously reduced in numbers.

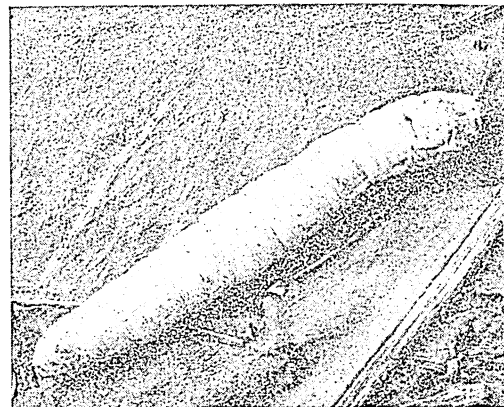
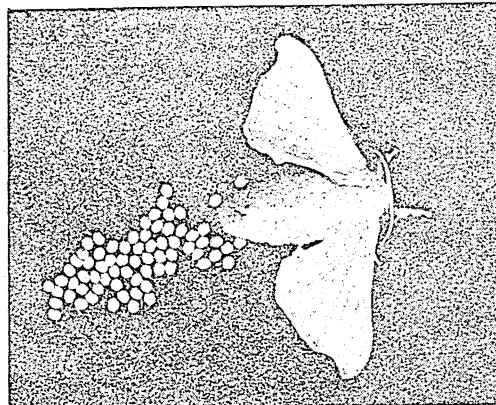
Fleas do persist, therefore we are not what we should be. Our flea-borne afflictions are a reproof and scourge from Nature. Our sins find us out; the innocent suffer for the guilty. The insects which we hold in detestation seem to be Nature's incitement to Man to scorn sloth, indifference, and ignorance, and to ensue cleanliness, care, and decency of life as becomes the highest of God's creatures.

PICTURE-STORY OF A PIECE OF SILK

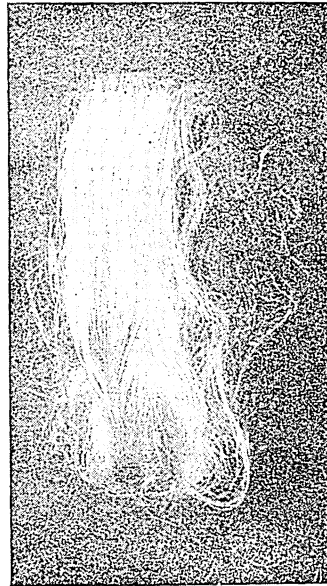
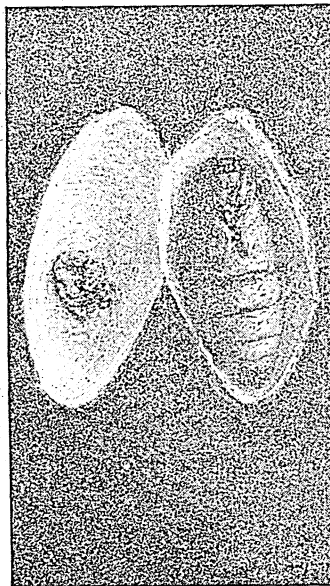


This picture by François Boucher, in the Wallace Collection, shows what beautiful things can be made from the product of an insignificant insect. The most glorious robes are the work of an unattractive caterpillar called by man a worm.

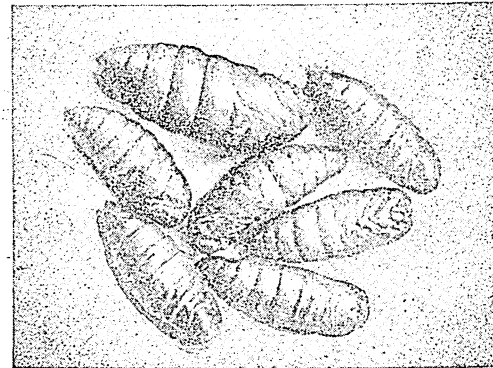
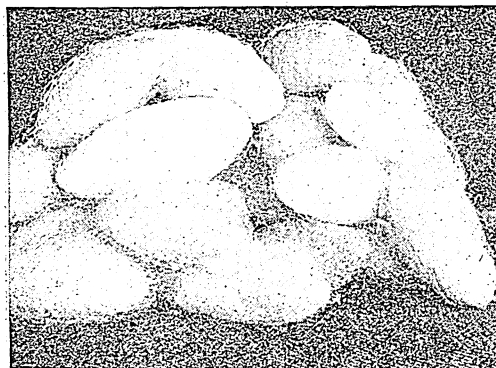
THE LIFE-STORY OF THE SILKWORM



The silkworm is the caterpillar of a rather unattractive cream-coloured moth, seen here on the left with the eggs that it has just laid. These eggs hatch out into little black larvae, which grow into the whitish-grey caterpillars, seen on the right. The caterpillars are each about three inches long.



After feeding voraciously on mulberry leaves, the caterpillar spins an oval cocoon of very fine silk, about the size of a pigeon's egg, as seen in the left-hand picture. The silk is generally yellow, but sometimes white. Each fibre is double and is spun from a viscid fluid that comes from two tubes in the body. The middle picture shows an opened cocoon with the chrysalis inside, and on the right is a skein of silk wound from the cocoon.

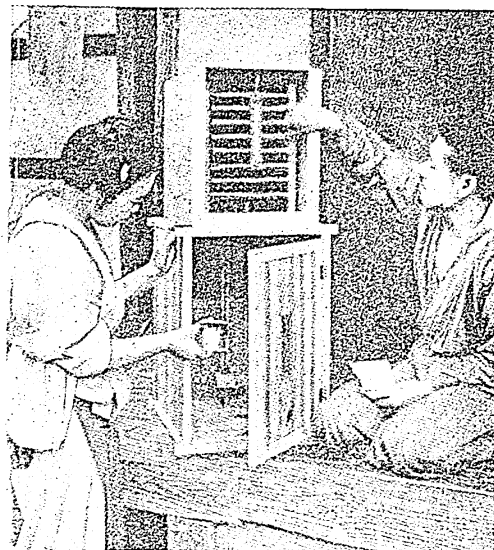


The left-hand picture shows a bundle of cocoons waiting for the silk to be wound off, and on the right are a number of chrysalids removed from the cocoons. About 1600 silkworms are required to produce one pound of silk.

THE SILKWORM HATCHES OUT FROM THE EGG



The moths are induced to lay their eggs on large sheets of paper, which are exposed to a current of air, and treated to prevent them hatching out before the mulberry leaves are ready. These girls are preparing eggs for hatching.



When the leaves are on the trees, the eggs are placed either in the sun or in an incubator, as shown here, in order that the heat may hatch them out. Gradually they change colour and on the fourth day the caterpillars emerge.



When the silkworms have hatched out they are placed on frames arranged in tiers, and fed day and night with the mulberry leaves. Workers are in constant attendance.



Here Japanese girls are gathering leaves in a mulberry grove. Enormous numbers of these leaves have to be collected, for the appetite of the silkworm is almost incredible.

COCOONS OF SILK READY TO BE WOUND



This picture shows the silkworm's work completed. The cocoons from which the raw silk is obtained have been spun on layers of grass or straw. The cocoons are completed by the silkworm in seven days and are then ready for use.



Silk is produced in considerable quantities in Syria, and these cocoons are being laid out to cool and dry before the silk is wound off. The photograph was taken at Antioch, where the disciples of Jesus were first called Christians.

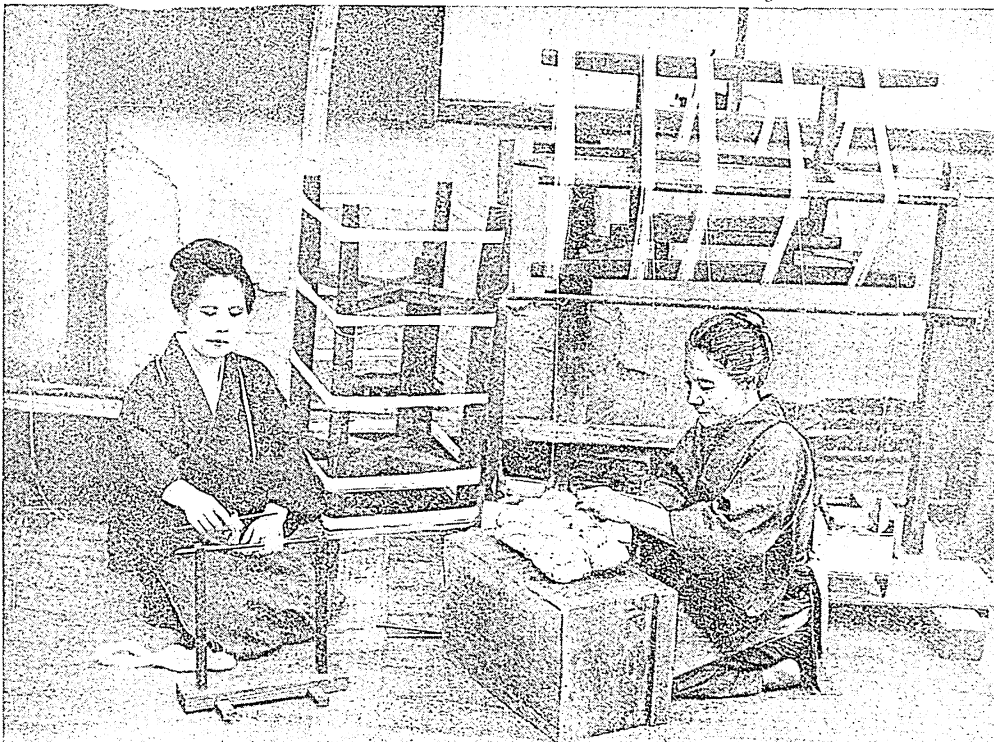
REELING THE SILK OFF THE COCOONS



The cocoons, before being sent to the workshop to have their silk wound off, are examined, and the best are set aside for carrying on the race of silkworms. These Japanese workers are grading the cocoons.

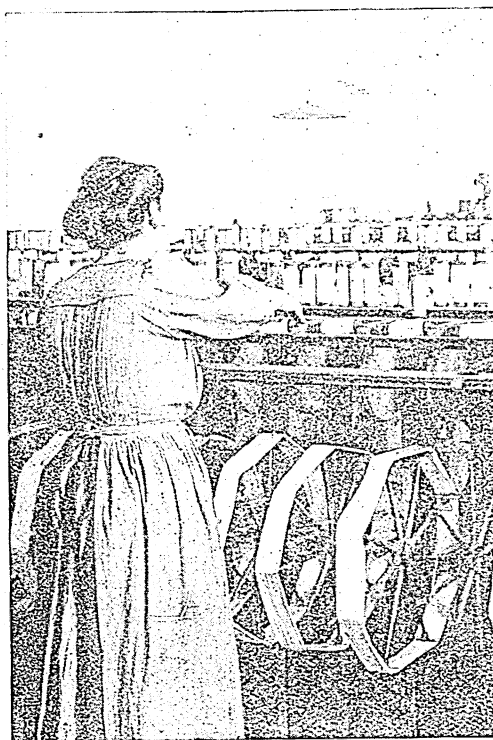


Before winding off the silk, the chrysalids have to be destroyed, and this is done by placing the cocoons, as this man is doing, in an oven, where the chrysalids are suffocated without ever waking to consciousness.

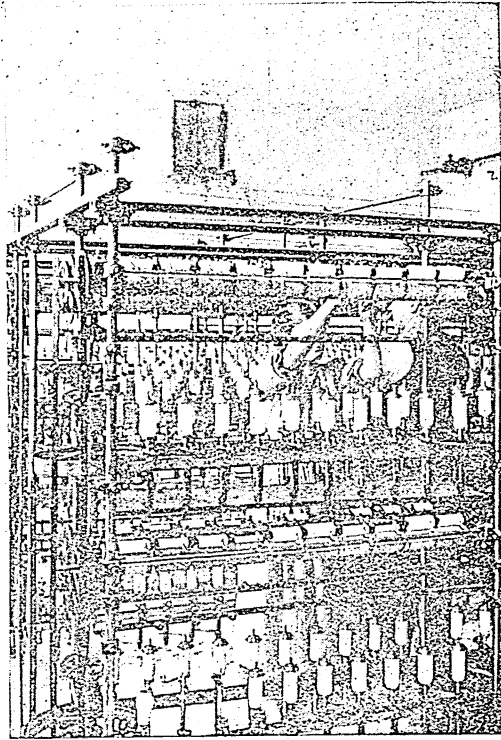


In order that the silk may be converted into beautiful fabrics it must be wound on to bobbins and spun into yarn, but this cannot be done until the silk has been reeled from the cocoons, as is being done by these Japanese women

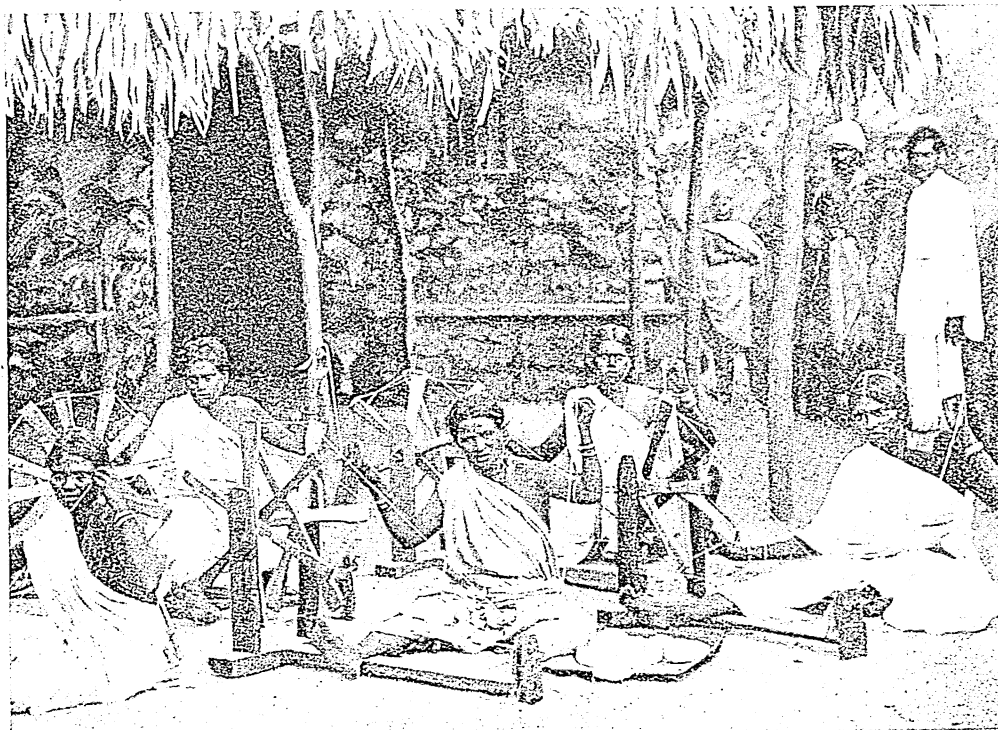
SPINNING THE SILK INTO THREAD



Here the silk obtained from the cocoons is being wound on to bobbins, in a French factory, ready for the spinners.



Here the silk that has been wound on to the bobbins is being spun into silk yarn in a great French factory.

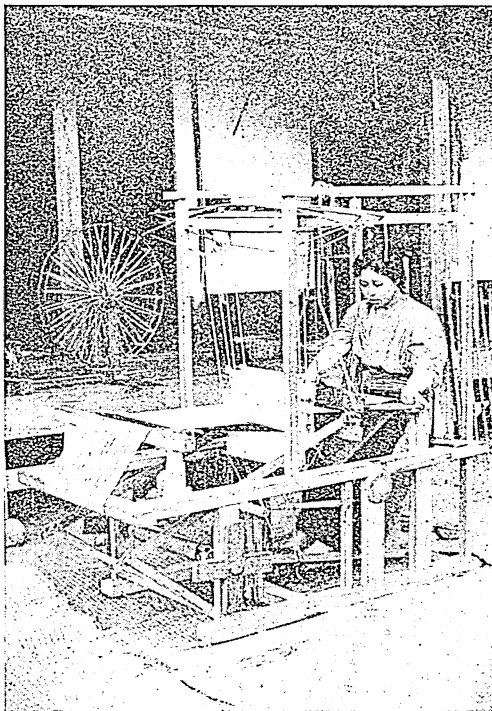


Much silk is produced in India, and these women, in a village of southern India, are spinning silk by means of very primitive spinning wheels, such as have been used there for hundreds of years.

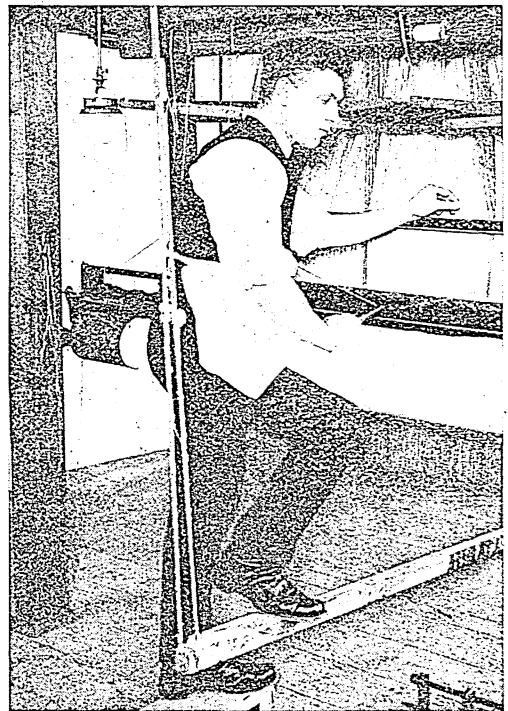
WEAVING THE SILK INTO CLOTH



This weaver in a Japanese home is producing by hand labour some of the beautiful fabrics for which Japan is noted. This simple method of weaving, however, is fast giving place to the factory methods shown on the next page.

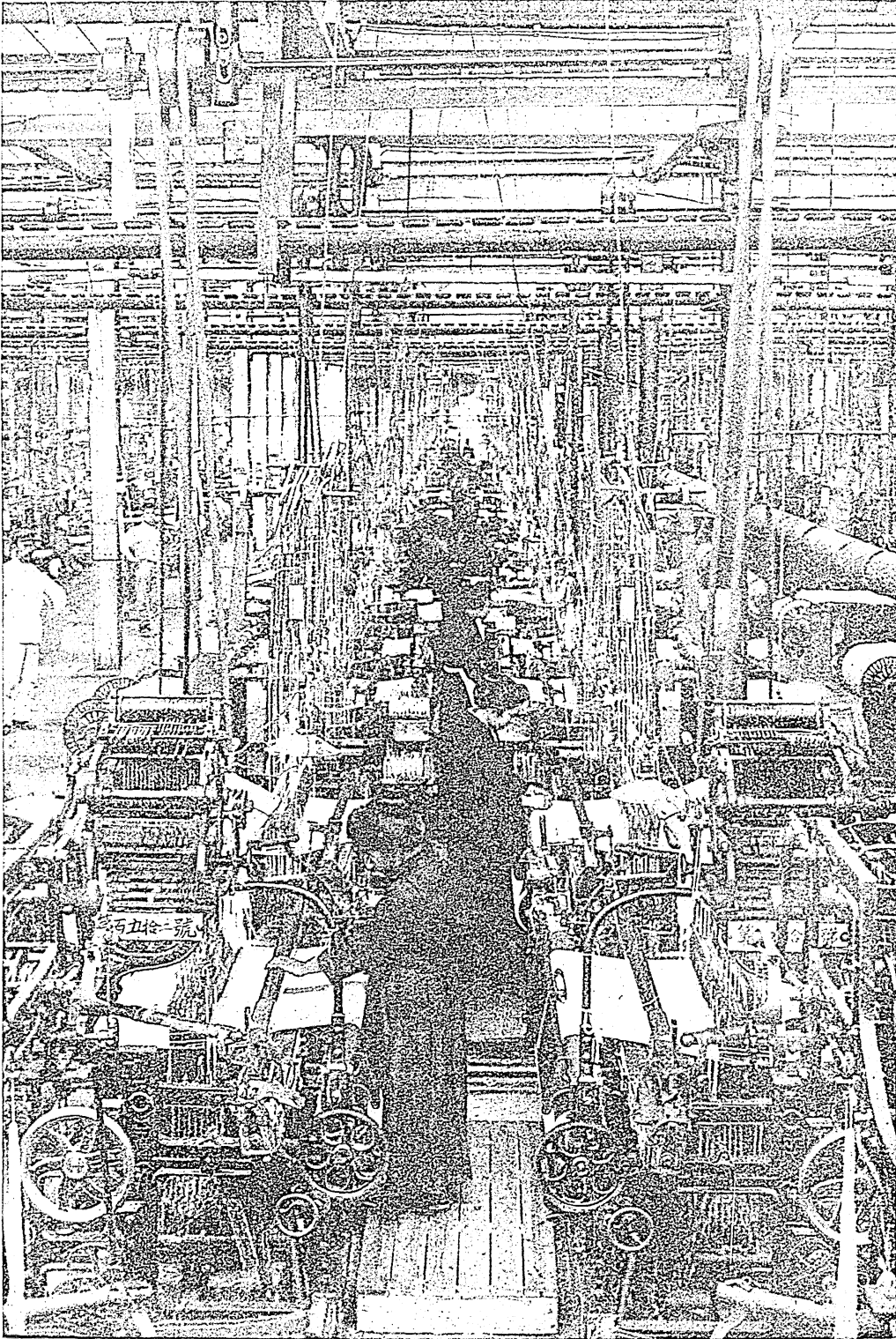


Here is another Japanese home weaver using a more elaborate loom, though one much less complicated than those that are used in factories.



An English weaver, working in Essex, who produced the beautiful silk cloth used for the wedding dress of Princess Mary, daughter of George the Fifth.

INSIDE A JAPANESE SILK FACTORY

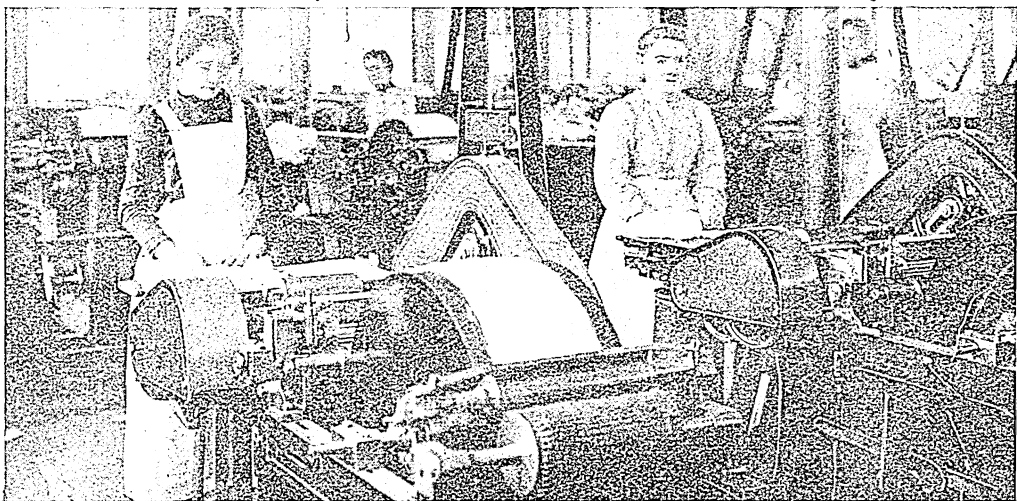


The Japanese are the greatest producers of silk in the world, having long ago outstripped the Chinese, from whom they learned the art. This picture shows the inside of a great Japanese silk factory, where some of the most beautiful fabrics to be found are produced by skilled workers. As can be seen, no space is wasted.

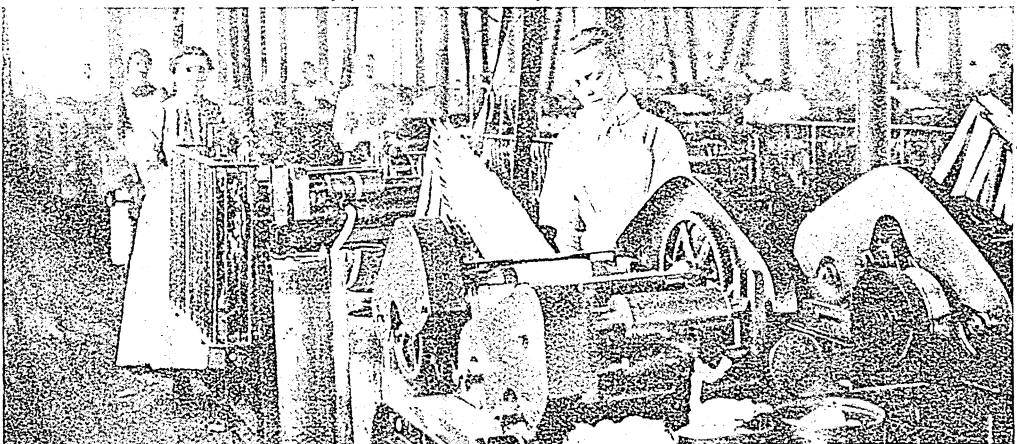
MAKING USE OF THE SILK WASTE



In the old days the refuse from silk was thrown away, but now it is all carefully saved and sent to a factory which weaves it into fabric. Here we see the waste arriving.

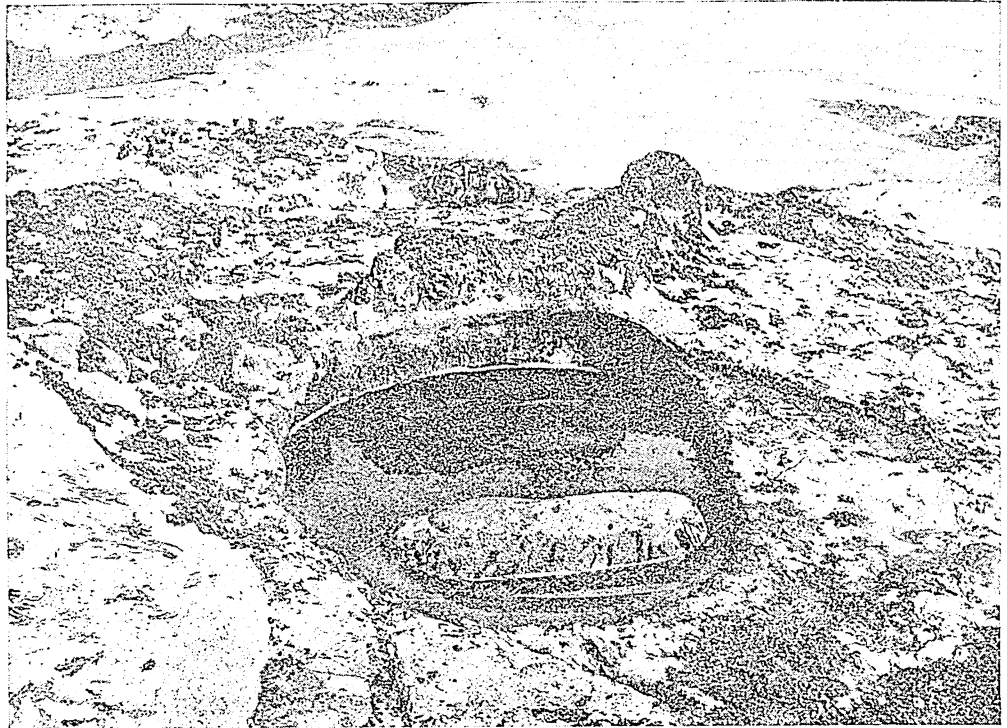


The waste is first cleaned and dressed, as it is in a very soiled condition, and this is a rather lengthy process. Then it is spread out as shown in this picture.

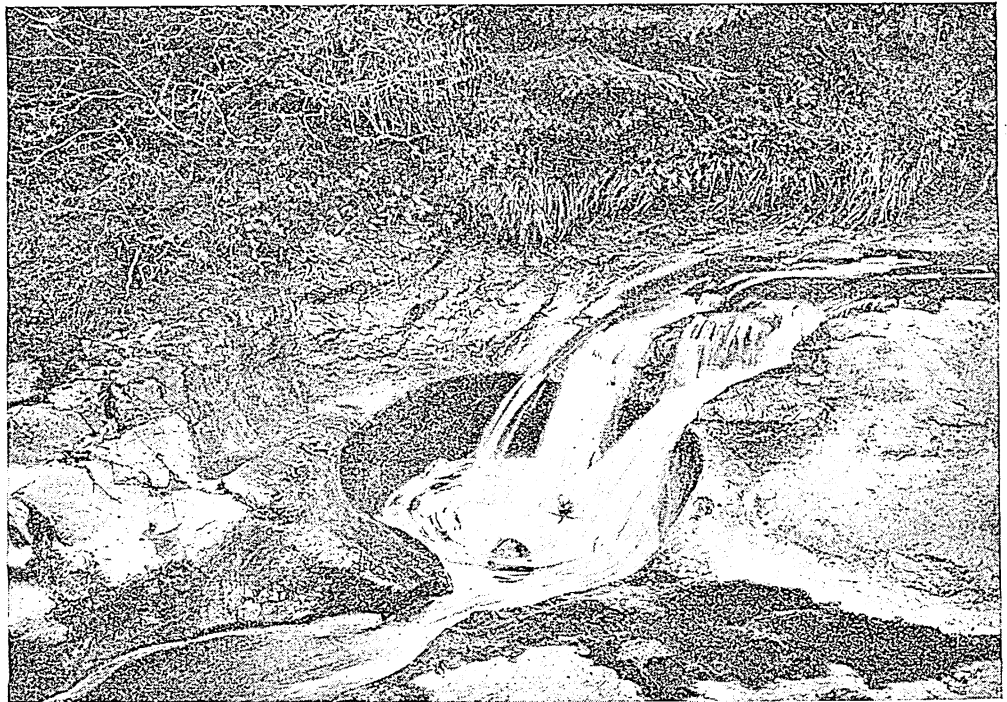


Gradually, after a number of processes, the slivers or threads of silk are drawn out evenly into orderly lengths, as shown in this picture, and these are spun into yarn ready for the weaver, who produces a beautiful silky cloth

HOW A POT-HOLE IS MADE



Here is a remarkably fine example at Ballycastle, in Ireland, of a marine pot-hole—a round cavity in the rocky shore carved out by the grinding action of stones and pebbles whirled round and round by the sea.



In this photograph, taken at Glenariff in County Antrim, we see a pot-hole actually in course of formation. The water rushing in from a flooded stream is whirling the stones round and round, thus deepening and enlarging the hole. See question on page 6103.

Plain Answers to the Questions of the Children of the World



Filling up the brain

CAN A BRAIN EVER GET FILLED UP?

Not long ago it would have been said that after a certain age our brains completely stop growing, but that is not quite true, because it has now been found that in almost all of the brains of the higher type of people there are a certain number of cells which have not fully developed so as to do any work, and which may develop even after we are fully grown up.

All this, however, is a mystery; and it is certain that in the case of many people there is no real limit to what the brain can do and hold. Robert Browning made a great scholar in one of his poems say, "No end to learning"; and this is a motto the wisest men have always believed in. It is also certainly a motto which keeps people young, young at any age, and helps to prolong their lives.

What this question means is whether the brain can become so filled up with knowledge that it can remember no more; whether it can be so full that new facts packed into it must displace old ones.

Before we can consider that as a possibility we must ask what memory consists of and how the brain is affected by memory or thought. The brain consists of unnumbered cells, some of which are certainly storehouses of memory, others being connected with cells which set in motion

nerves that give orders to the body's muscles. Every time we have a thought, every time we make a movement, there must be thousands of brain cells in action to register the thought that produces the movement; and every time there must be some wastage of them. But the body is always renewing the brain cells, and the brain as a whole wears out perhaps less than any other part of the body.

In the brain there is a wonderful division of labour. There are brain cells for receiving sensations, brain cells for giving orders to the muscles or the organs of the body, and besides these there are what are called association nerve cells (or *neurones*), which are far more numerous than all the rest put together and are the connecting link between the others. They are all found in one portion of the brain, and may be described as the nerve cells of experience. They register and keep a record of experiences and impressions conveyed to them by the other nerves, and they may, indeed, be regarded as the storehouse of impressions.

What they have done once they will remember partially to do another time, and when they have done it a great many times they do it very readily. If, on the other hand, they do not have practice in

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doing things they forget them. So, by the growing old of the association of neurones, the nerve cells of experience, the right hand may forget its cunning, or the memory may forget the year of Magna Carta or any other date.

Thus the brain may in a way get filled up, not because its experience cells can carry no more, but because new experiences, new impressions, new facts may have given them new things to do which they remember better than they remember others which went before.

Often when people grow old they remember best their childish experiences. That is perhaps because the experience cells, relieved from the pressure of new work, are able to recall their old ways.

Why Does My Face Turn White When I am Frightened ?

The skin of our faces has a certain amount of colour of its own, but the main part of the colour of the face—at any rate, in this part of the world—is the colour of the blood shining through the skin. It is the heart that drives the blood through the skin of the face. When a person is frightened the nerves running from his brain to the heart almost stop the heart from beating, so scarcely any blood whatever is sent through the skin of the face, and we see the pale colour of almost bloodless skin. Anything that interferes with the heart's beating will have the same result as fright: bad air, for instance, causing anyone to faint. When a person's face becomes extremely pale, we should understand that there is a risk of his fainting, for if not enough blood is passing through his face, it is probable that not enough blood is passing through his brain. In some people, whose hearts are not strong, it is difficult to supply the head with enough blood.

Where Does the Rainbow End ?

As we trace the rainbow down on each side it seems to touch the earth, and there are stories of children who have set out to find the end of the rainbow. But the rainbow ends nowhere, for it is a mere appearance in the sky, due to tiny drops of water, and it "ends," if we are to use that word, simply where the drops of water end that are so placed as to reflect the sunlight in this way to our eyes. Really no two people see exactly the same rainbow. They could not do so unless their eyes were in the same place. As we move, the bow we see moves with us.

Does Camphor Keep Moths Away ?

Camphor, like most other things that have a smell, is what we call *volatile*—that is, it gives itself off into the air in the form of a gas. Like many other volatile things, camphor is an *antiseptic*, a thing, natural or artificial, that is very bad for the lives of microbes.

Now, most things that are poisonous to microbes are poisonous to insects. Indeed, as a rule, a poison to any kind of life is a poison to all kinds. Camphor in large doses would kill a man. The camphor gives itself off into the air around it, and as it is very poisonous to moths, the moth flies away when it smells camphor. It is a great advantage when an antiseptic is volatile, and all the most useful antiseptics are so. If a thing is not volatile, it can only have its effect on anything that touches it.

But if an antiseptic is volatile it flies about in the air as it spreads, the amount of it in the air gets less; and so insects or microbes can get within a certain distance and not suffer; but they cannot go nearer, or else they would be killed. Every antiseptic we use to preserve clothes by putting it in a drawer will therefore protect all the contents of the drawer.

Why Do We Always Want to Run Down a Steep Hill ?

If we could see the Earth as a great ball, we should notice the hills as places where the surface of the ball sticks out. It is rather like an old composition cricket-ball that has got rough. Now, plainly, in such a case anything on the top of a rough place is farther from the centre of the ball than anything lying in the hollow between rough places.

The case of the Earth is the same. When we are on the top of a hill, we are farther from the centre of the Earth than when we are at the bottom of a hill. The Earth's attraction, which we call gravity, is always trying to pull us and everything else as near as possible to the centre. So when we start going downhill we do not so much drive ourselves as allow ourselves to be pulled by the Earth's power.

We notice this best, perhaps, when we coast down hill on a bicycle; but it is just as true when we are on our legs, only that we cannot roll as the bicycle wheels do. So our natural inclination, provided of course that we are not afraid of hurting ourselves, is to yield to the Earth's pull and run downhill.

Did Any of the Apostles Come to Britain?

Although many of the Apostles are said to have travelled far and wide, there is no record of any of them having come to Britain. Still, this does not make it certain that none of them came. Britain was within easy reach of Rome, and we know Paul went to Rome, and Peter also. But it is not likely that Paul came to Britain. He tells the Roman Christians in his letter to the Romans that he hopes to go on to Spain after he has seen them, and Clement of Rome, a great and good man, in a letter he wrote to the Corinthians in A.D. 96, mentions the fact that Paul went "to the extreme of the west," or "to the western limit."

There is no doubt, however, that the Apostles literally obeyed our Lord's command, and as far as possible preached the Gospel to every creature. John settled at Ephesus; Matthew is said to have preached in Ethiopia; Bartholomew visited Asia and Arabia. Thomas is reported to have founded the Church in Persia, and Andrew to have gone to Scythia. And there is very little doubt that at a very early date the Gospel was preached as far away as India.

What is a Pot-Hole?

A pot-hole is a cauldron-shaped cavity which may sometimes be seen in the rocks by the sea, or near a swiftly-flowing river or a waterfall. In all cases the cavity is formed in the same way. It starts as a slight inequality in the surface, and then the revolving in it of loose stones by the eddying water sets up a grinding action, which gradually wears away the cavity until it becomes quite a deep hole. Of course the stones, in excavating the holes, are themselves worn down to sand or gravel, but fresh stones are washed in to take their place. On the sides of narrow gorges traces of old pot-holes are often to be seen high up above the present level of the torrent. See pictures on page 6100.

Why do We Shiver When We are Very Cold?

There are more good reasons than one why we shiver when we are cold. The machinery of it, as we may say, is that cold, *at first*, rather excites and disturbs the nervous system, as heat usually soothes it. We notice these contrary effects of heat and cold in the case of a warm bath and a cold dip. This, of course, is not to

say that shivering is the same thing as the feeling of activity we have after a cold dip; but in each case the cold has been what is called a stimulant. But now we have to ask whether the shivering is of any use to us, or whether it is a wholly useless and purposeless thing. Beyond any doubt it is possible to show that shivering serves the purposes of the body as hunger does. One good reason for shivering is that it makes us aware of cold as we might not otherwise be, and so we can protect ourselves.

Why Cannot We Sleep with Our Eyes Open?

To begin with, one reason why our eyes are shut during sleep is that it needs effort to keep our eyes open. When we get sleepy we relax that effort, and our eyelids drop of their own weight, "softly as tired eyelids upon tired eyes." So that is one answer to the question. We cannot sleep with our eyes open because we cannot hold our eyelids up when we are asleep. But another question is, Why would it keep a man awake to hold his eyes open in the light? The reason is that light keeps us awake by exciting our brain, and when we want to go to sleep, of course, one of the first things we have to do is to shut our brain off from the outside world by darkness and by silence. So there are two answers to our question: one is that when we are asleep we cannot hold up our eyelids any more than we can hold both arms up in the air, and the other is that light keeps the brain awake and active.

What is the Sorbonne?

The Sorbonne is the seat of the faculties of science and literature in the Paris University and the chief centre of French learning. It is named after its founder, Robert of Sorbonne, a chaplain of King Louis the Ninth. The original aim was a special establishment where religious studies could be brought within the reach of poor students.

From an ecclesiastical centre of learning the Sorbonne grew in the nineteenth century to be a seat of modern learning. The first books printed in France were printed at the Sorbonne, and in the seventeenth century Cardinal Richelieu had it enlarged. The library of the Sorbonne has 600,000 books and manuscripts. Its amphitheatre is the meeting-place of all the famous scholars of France.

Why is a River Always Moving ?

The water of a river, like everything else on the surface of the Earth, is always being pulled as near as possible to the centre of the Earth by gravitation. Even when a river or a stream is rushing fast downwards it still stays on the surface ; but we must remember that the new part of the surface it reaches is nearer the Earth's centre. When anything falls towards the centre of the Earth it loses some energy which it had in it before it fell, and we must ask where the water got this energy from—the energy which, for instance, will turn a mill-wheel. What raised the water in the first place, and never fails to raise more water ? It is the Sun. And so the answer to our question is that a river is always moving because the Sun is always shining. The Sun's power raised from the sea the water that falls as rain, and makes rivers. Therefore it is really the Sun that turns the mill-wheel, and it is the Sun that opposes us when we try to swim or row up-stream.

What is a Patent ?

A patent is a document issued by the Patent Office (a Government Office worked as a part of the Civil Service) to secure for inventors any profit they may be able to make, over a reasonable period, from an invention that is new and immediately useful. The period of monopoly accounted reasonable is fourteen years. If, however, the inventor can show that he has not, in that time, been sufficiently rewarded, the period may be extended. A patent will not be granted to anyone who uses his invention for purposes of profit before he patents it. The patent must be granted first, and the invention not be used for profit till the patent has been secured. The object of this restriction is to discountenance the concealment of inventions, as such concealment might lead to an invention being used for the purpose of profit for many years.

If an invention has been and remains in use unpatented, unknown to a patentee, his patent is made void by the prior discovery. A general principle cannot be patented, but only its practical application to a definite useful purpose. The granting of a patent does not ensure the patentee against an action for infringement of an earlier patent. The question of infringement is a legal question, and the Patent Office is not a law court.

Why is the Sky Dull when a Storm is Coming on ?

The light of day is almost all due to direct sunlight and to skylight, which is sunlight reflected from the sky—that is to say, from the air. When a storm is coming on, the clouds gather, and as these clouds are thick and dense they cut off the light of the sky, and so we say that the sky is dull. If we went up in a balloon above the clouds we should find ourselves in brilliant sunshine, even when it was as dark as night to the people on the Earth.

What Makes a Whirlpool ?

We make a little whirlpool when we stir our tea, and a whirlwind moving above water will set it whirling for a time. But in many parts of the world there are great whirlpools which remain from day to day or from century to century. The cause of them is the meeting of two currents of water, especially rapid and strong currents. When we take a top or a ball and hold it between our hands and spin it by pushing one hand from us and pulling the other hand towards us, we really see how two opposing currents may affect the water where they meet.

There is a great whirlpool below the Falls of Niagara ; another, about which wonderful stories have been told, is the famous Maelstrom off the coast of Norway ; but the most famous of all is the whirlpool called Charybdis, in the Strait of Messina. We know that this whirlpool existed thousands of years ago, but the region is terribly liable to earthquakes, as everyone now knows, and it is said that the position of Charybdis has been altered in consequence. Not far from where Charybdis used to be was a great rock, dangerous to sailors ; its name was Scylla. It was very difficult for small ships to pass between the whirlpool and the rock without being engulfed in the one, or wrecked upon the other, and to this day, when a man has to steer his course of life very carefully between two dangers, we say that he is between Scylla and Charybdis.

What is the Cap of Liberty ?

Freed slaves in ancient Rome wore the Phrygian cap in token of their freedom. The Phrygians were a race of Greek origin whose name meant freemen, and their characteristic headgear has stood for freedom ever since. The red cap which was worn during the French Revolution was called the Cap of Liberty.

Can People Tell Our Fortunes?

There is a way in which people can tell our fortunes, and there is another way in which they cannot. No one can be certain of the future, but if we find that a man is strong, and brave, and true, and persevering, we know that certain things are very likely to be done by him. If we find that he eats and drinks too much, is lazy, and cowardly, and cruel, we can, in a sense, predict his fortune also. People who pretend to tell fortunes manage to get a certain amount of success because chance makes them right in certain cases, and because they study, as carefully as they can, the character of the people who come to them. They know the tremendous truth that a man's character is his destiny; and so, if they can tell his character, they can tell his fortune. But they cannot by any means tell a single one of the things for which foolish people go to them.

Should We be Afraid to Die?

No animal is afraid to die, but that is because it does not think of the future, and cannot know what death is. A child does not *naturally* fear to die, though we can easily make ourselves afraid. For ages past many men have made it their business, for one reason or another, to teach people to be afraid to die. This applies only to our part of the world. In Asia, where the greater number of all mankind is still to be found, men are not afraid of death, but in our part of the world they are, and for two reasons. The first is that we are usually taught that death is painful. A natural death is no more painful than going to sleep. In both cases we slowly lose our feelings, because the amount of carbon dioxide and other substances in the brain prevent it from feeling any more. Nature is most merciful in this respect. It is the rarest of events for a death to be other than a quiet, peaceful going to sleep, from which there is no waking here—a scene painful to the lookers-on, but not to the dying person.

Then men fear to die because of "the dread of something after death." Only the wisest of us, and those who believe in their hearts what they profess to believe with their lips, know that "To the good man no evil thing can happen," as Socrates said before they poisoned him.

What is the Pilgrim's Way?

The Pilgrim's Way is the name given to two routes that led, one from London and one from Winchester, to the shrine of Thomas à Becket at Canterbury. In spite of the changes wrought by nearly four hundred years, much of these old paths of peace, as well as the by-ways that led from them to churches and shrines in their neighbourhood, may still be followed. The way described by Chaucer in his *Canterbury Tales* is the one that led from Southwark through Deptford, Crayford, Dartford, Rochester, Chatham, Rainham, Newington, Sittingbourne, Bapchild, Ospringe, and Harbledown. The other way led from Winchester through Alton, Compton, Shalford, Albury, Wotton, Shere, Reigate, Chevening, West Malling, Otford, Wrotham, Hollingbourne, Charing, Godmersham, Chilham, and Harbledown. It crossed the pleasant Hampshire downs, traversed the Surrey pinewoods, the goodly land of Kent, the valleys of Itchen and Wey, Mole and Stour and Medway. The scenes through which this older way passes are fair and beautiful, and the memories it stirs belong to the noblest pages in England's story. Some of the dark yew trees that marked many a mile of the old way still stand, and, though parts of it have been enclosed, diverted, or despoiled, the grassy track still winds along the lonely hillside overlooking the blue Weald, parts of it, indeed, older than the days of the famous shrine, for it marked a route that was followed in pre-Roman times, one of the earliest highways in the British Isles.

What is Reinforced Concrete?

Concrete is an artificial stone made up of sand, cement, and broken fragments of natural rock. The materials are mixed up with water in varying proportions, according to the purpose for which the concrete is to be used, and the plastic mixture is then run into wooden moulds of the desired size and shape. When the concrete is required for building purposes it is necessary that the slabs hold firmly together, and to ensure this the mixture has embedded in it steel or iron bars, rods, wire, or netting. The concrete is poured round these while still plastic, and hardens with the metal inside. It is then called reinforced concrete, because the stone has been reinforced or strengthened by the metal.

Who is Britannia on a Penny?

The figure of Britannia on an English penny originally represented an actual lady who, in her day, was regarded as a model of beauty. The lady was Frances Stuart, Duchess of Richmond, and it was in the reign of Charles the Second that her likeness was transferred to all the copper coinage. We can judge whether she is fairly pictured as Britannia, for her portrait was painted by Sir Peter Lely, the fashionable artist of her time, and it hangs in the Barbers' Hall in the City of London. There is a copy of it in Hampton Court Palace, and in the Islip Chapel of Westminster Abbey is a wax effigy of the lady as she appeared at the coronation of Queen Anne. She was very fond of animals, and in her will left legacies to people to look after her cats, thereby giving that caustic little poet Alexander Pope an excuse for his line

Die, or endow a college or a cat.

Does a Flower Sleep at Night?

Plants do go to sleep at night for several interesting reasons. Animals depend on plants and trees for their proper air, and plants and trees depend on animal life for theirs. Plants take in the carbon dioxide from the air, using the carbon and giving out the oxygen, thus forming material for the life of animals. Animals, that is, men and beasts, breathe out carbon dioxide, and so keep the air fit for the life of plants. We could not live without plants, and plants would die but for us.

But when the sun is shining, or so long as light lasts, the plant is so busy taking in its store of carbon dioxide that it has not time to put forth the oxygen due from it. When the daylight dies away, the plant ceases to take in the carbon, and, while sleeping, gives off its oxygen. A flower takes its food in the day and grows at night. It becomes heavier during the day, but lighter during the night, when it is giving off and not taking in anything.

But we must not suppose that plants sleep only at night. Some sleep during the day and wake up in the evening. Pollen has to be brought to many plants by insects. Some insects sleep by day and work by night. These are they which visit the night flowers, carrying the pollen which they need.

Then there are early risers among the flowers. The crocus, for instance, wakes early and goes to sleep soon after midday.

Plants and flowers seem to know as well as the wisest of human beings what best to do. Some are so delicate that they cannot bear the glare of the hot sun, so they go to sleep before the heat becomes too great for them, closing their petals and protecting their sensitive parts. Others cannot bear much moisture or cooling, and they go to sleep and keep snug until all is safe again.

For the most part it is at night that the plants sleep. The flowers close their petals with wonderful neatness; the leaves curl; some stalks hang limp, while the stalks of others, in order to let out the oxygen, have to keep erect, as we do when we wish to breathe deep breaths. We can learn a good deal by watching the daily life of the common wild daisy.

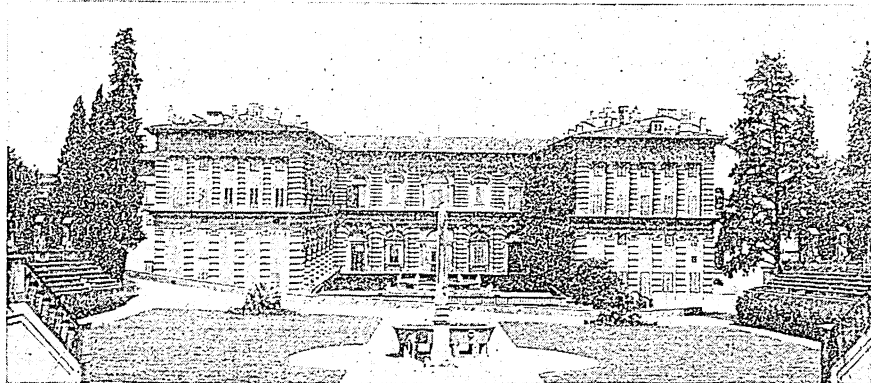
What is Goldbeater's Skin?

Goldbeater's skin is made from the peritoneum of an ox, a skin which protects the internal organs and acts as a wall to the abdomen. Its chief use, and indeed the use which gave goldbeater's skin its name, is in connection with the making of gold leaf. Gold leaf as used for gilding is actually real gold, or sometimes an alloy of gold and another metal, which has been treated to annealing and hammering processes till it is about only one 290,000th of an inch thick. After several preliminary processes, small, thin squares of gold are placed in a pile and between special paper, and then hammered. As the gold becomes thinner it, of course, spreads out. It is then cut into smaller pieces, piled between sheets of goldbeater's skin, and again hammered. This process is repeated two or three times, goldbeater's skin being the separating material for each successive hammering, which becomes lighter as the leaf becomes thinner, till the desired degree of thinness is reached. Goldbeater's skin is also used for the making of ballonets for airships, but its most familiar use is in the home for the treatment of cuts.

Why do Leaves Change Colour in the Autumn?

In the autumn the beautiful green stuff made by the sunlight in the plant changes and goes. It is not that the plant is dying, but that it is going to rest for the winter. As it is not going to use its leaves, it takes out of them everything that will be useful. In doing this the plant or the tree changes the green stuff in the leaf, and so we get various colours produced in the autumn.

The Story of the Beautiful Things in the Treasure-House of the World



The back of the beautiful Pitti Palace in Florence

THE RENAISSANCE IN ITALY

WE were last thinking of Gothic architecture, that vast growth which seemed, during the first hundred years of its branching, to be something of a miracle. It was, we remember, a religious architecture, and as such came to its end and died.

There have been revivals in Gothic; one of them produced a number of buildings in England during the last century, but there have never been any developments. Nothing has been evolved out of Gothic suitable for municipal buildings.

The style which followed it rose in a country where the Gothic movement had found little favour—Italy. It bears the general name of Renaissance architecture; but this must not be confused with the Renaissance in painting and sculpture which happened much earlier.

When Renaissance architecture arose the Middle Ages were past. The invention of the printing press had naturally resulted in a wider reach of scholarship than had been possible when the monks were the sole tutors of Europe.

The spreading of printed books throughout the Continent had two results—the Reformation and the Renaissance in architecture and literature. Books made men think, made men rub their eyes and dimly apprehend the loveliness of Greek and Roman art and literature. In reaction,

they presently turned aside from productions of medieval Europe, and found nothing worthy unless it was of the classic spirit. To this intense interest in the history and literature of the past, in the fifteenth and sixteenth centuries, was given the name of Humanism.

In addition to these internal forces there was an outside event of much significance. In 1453 Constantinople, the centre of Greek and Roman art and learning, fell to the Turks, and a great number of Greek scholars, fleeing from the new Power, settled in Italy. They came at a time when the country was sensitive to their "touch," and the effect on Europe as a whole was immeasurable.

Thus, after being forgotten for a thousand years or so, after centuries when the buildings of the old Roman Empire, containing beautiful Greek statues, had merely served as a quarry, classic art became triumphant in Italy, and produced, among other things, Renaissance architecture.

This new style, we must remember, which first appeared in Florence and her neighbouring towns, was born of classic ideals, but it was not classic architecture simply copied in another country. It was an architecture that used classic ideals in so far as they were suited to the needs of a race whose religion, government, and

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styles of living were far removed from those of ancient Greece and Rome. Therein lay its strength.

It grew slowly, like all great styles. From the outset it was as much suited to secular as to sacred buildings, and it was different from Gothic in that its construction was saner and capable of infinite development. It branched out in many directions, and to it most of the buildings of the present day can be attributed.

THE DIGNITY AND STRENGTH OF THE BUILDINGS OF FLORENCE

When Florence took the lead in Renaissance architecture she was a very queen of cities, and there were many stars in her crown. She led Europe in the matter of art; her great industry and pride had created an immense wealth and power; she was the strongest force in Italy. She was nevertheless at the mercy of the fortunes of war, within and without, and it was natural that her chief buildings should be in the style of fortress-palaces for her reigning princes, like the Medici.

There was plenty of fine stone and marble in Tuscany, and this material, being quarried in large blocks and set rough-hewn in the courses of the walls, gave at once a rugged character to the new architecture. The chief note of buildings like the Riccardi Palace and the Pitti Palace in Florence is enormous strength combined with a very fine dignity.

The architects seemed to begin these great palaces with the idea of a four-square fortress, and made as few openings on the ground floor as possible. One can easily imagine the Riccardi standing a siege. In the higher storeys the buildings seemed to breathe a little—set with tall, rounded windows in undeviating regularity. Sun screens catch the light and make patches of shadow on the stonework. Then, surmounting all, a huge cornice ran its unbroken line round the building and seemed to frown down on the narrow street with its gaily dressed passers-by, and dare an intruder to touch the palace door.

THE FINE FINISH A CORNICE GIVES TO A BUILDING

The Riccardi, famous for ever because of the Medici, for whom it was built about 1430-34 from the designs of Michelozzo, is the most fortress-like of these early Tuscan palaces. It was known as the palace of the Medici, and only took its present name when, in 1659, the Marquis Riccardi became its owner.

The Strozzi Palace is another of these fine rugged buildings, set up in 1489. Two architects, Da Majano and Cronaca, worked on it. Cronaca also built the Guadagni Palace. The Ruccellai Palace, erected about 1450, marks a slight change. It has no cornice—suffering a little thereby, for that frowning line finishes a building in a very fine way—and on the Ruccellai appear for the first time the classic pilasters which became such a feature in Renaissance architecture.

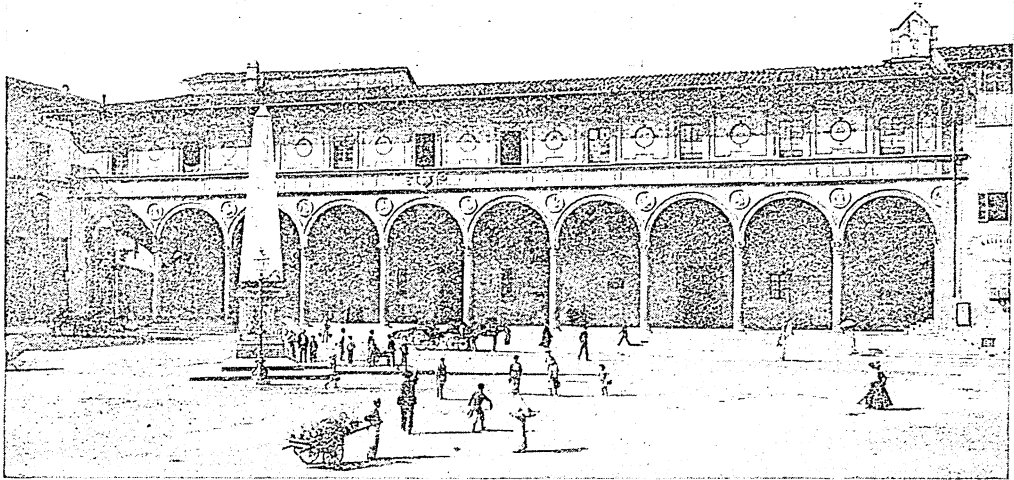
Among these princely houses the Pitti Palace stands as chief, famous the world over. It was begun by Brunelleschi, the first great architect of the Renaissance, in 1441, and about a hundred years later was finished by Ammanati. The palace was built for Luca Pitti—one of the powerful fifteenth-century Florentines, a great tyrant who used his power as magistrate to force citizens to find money for his palace. When the family fell on evil times the house was sold to beautiful Eleonora, wife of Cosimo I, the Grand Duke, in 1549. Eleonora caused the famous Boboli Garden to be constructed. Part of its lovely stretch faces the chief court of the Pitti, where the architect allowed himself to set up the classic columns which look beautiful in the court and would have spoiled the front of the building.

THE WORK OF CENTURIES IN THE NOBLE PITTI PALACE

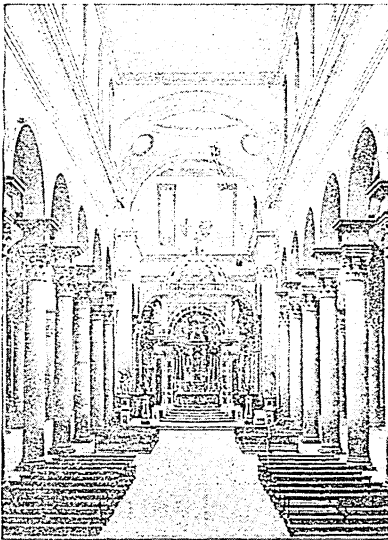
The world owes a great deal to the various people, patrons and architects and artists, who during the course of three hundred years conspired together to make the Pitti Palace one of the noblest places in the world. The building stands on rising ground, overlooking the city and the river, and round it, like a great girdle, is thrown the greenery of the garden. The additions that were made in the eighteenth century, after the Pitti had become the home of the reigning king, happily did not mar its beauty. Except for the Vatican, it is the largest palace in Italy.

The Pitti Palace is one of the buildings that one can call noble—most palaces are either grand or beautiful—and this nobility is due not to its great size, but to its symmetry and perfect proportions, and the long sweep of its lines. Its weight is horizontal rather than vertical, and this strength is increased by the lines that accentuate the storeys, and not lessened by one superfluous vertical line or ornament.

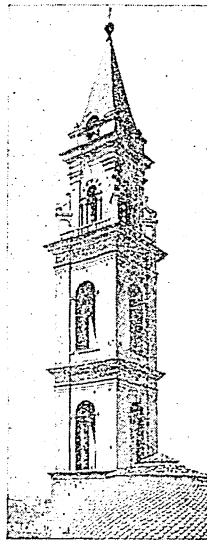
THE BEAUTIFUL ARCHITECTURE OF ITALY



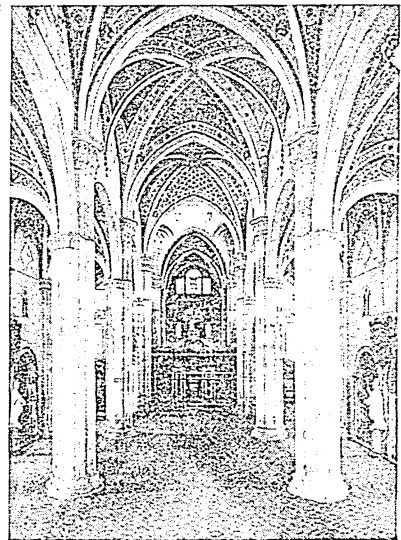
THE LOGGIA OF SAN PAOLO IN FLORENCE



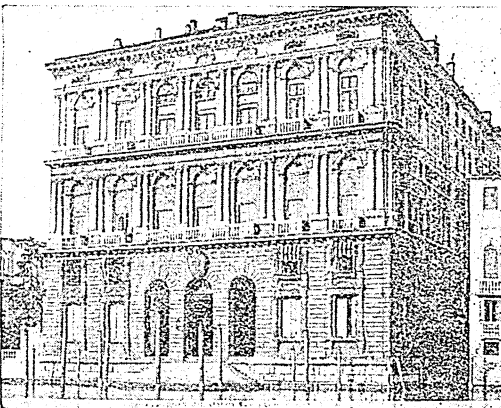
THE CHURCH OF ST. SPIRITO
IN FLORENCE



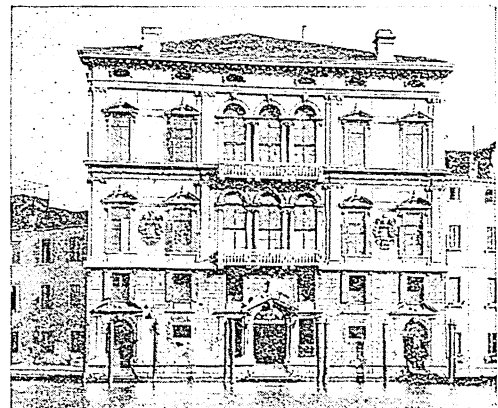
THE CAMPANILE OF
OF ST. SPIRITO



INSIDE THE CHURCH OF THE
CERTOSA OF PAVIA



ON THE GRAND CANAL IN VENICE



BALBI PALACE IN VENICE

The pictures on these pages are by Messrs. Alinari, Anderson, Brogi, McLeish E.N.A. and others

From the Pitti, which contains great treasures of art, a gallery runs on to the Uffizi, once a palace, and now one of the finest art galleries of the world.

When we think of our own achievements, or the work of the last hundred years, we cannot help feeling that the world is passing through a dry period, like the seven lean years of Pharaoh's dream.

THE SPIRIT THAT IS MISSING IN THE WORLD TODAY

We have never been visited again by the fine spirit that created the Italian Renaissance. In those days a man took in his stride something that nowadays would be a separate life-work. It was quite usual for an architect to be also sculptor and painter of note. The shining examples of this wealth of genius were, of course, Raphael and Michael Angelo. But men whose names are not so honoured shared this richness and fulness of genius. The architect was naturally an artist of first quality. And, moreover, during this period the servants of architecture, the craftsmen, were persons of great gifts. The wood-carvers, goldsmiths, ironworkers, the kind of sculptors we should call now monumental masons, alone would have made the century memorable. At the end of the Renaissance the wave of golden energy ebbed away. Since then we feel that our best efforts have only been imitation.

Many architects were at work in Florence and the neighbouring cities—men like Borgognone, Michelozzo, Filarete, Alberti, Alessi, Cronaca, and Brunelleschi, the most gifted of them all.

THE SPLENDID PALACES TOWERING ABOVE THE NARROW STREETS OF GENOA

The Renaissance helped to make Genoa, already marked by some fine churches of an earlier period, a most individual and distinguished-looking town. As in all the great Italian cities, palaces were built for her princes of commerce, and threw up their beautiful lines high above her narrow streets. One of the most famous, now known as Municipio, was the Doria-Tursi Palace, built at the end of the sixteenth century. Earlier than that, Alessi was at work in Genoa, and to him more than anyone else is due the guiding of the taste of persons who were so willing and glad to make their town beautiful. Under Alessi's leadership the authorities reformed their famous street which is now called the Strada Garibaldi, and almost all the palaces that make it so picturesque are

this architect's work. Others set up at a later date, like the Balbi and the Durazzo, owe much to Alessi's teaching.

One of the earliest town hospitals in Europe, the Ospedale Maggiore, rose in Milan during this period. In northern Italy most of the important works were buildings of a secular nature. Many churches and cathedrals, like those of Florence and Genoa, were altered and added to, and some new ones built. In Florence there was St. Spirito and St. Lorenzo, and the Pazzi Chapel—one of Brunelleschi's most beautiful little buildings; and in Genoa St. Maria in Carignano, the work of Alessi. The most important church of this group, historically speaking, is St. Andrea, Mantua, as it was the first to be built in the style that has been accepted as pure Renaissance.

THE TRIUMPHAL ARCH WHICH LEADS INTO A CHURCH

St. Andrea served as a model for many later buildings of a sacred character. The Roman arch was now being used by architects for the chief entrance of a church. A good example is St. Francesco, Rimini, whose principal porch was to be a copy of the Arch of Severus. Unfortunately the façade was not finished. In St. Andrea, Mantua, the Roman triumphal arch forms a magnificent entrance.

One of the most interesting buildings of Europe is the Certosa at Pavia, the city where so many scholars found peace in the tumultuous years of northern Italy. The Certosa was planned in the fourteenth century by the chief lord of Pavia, who had determined to have "a palace wherein to dwell, a garden wherein to disport himself, and a chapel wherein to worship." It was begun in the Gothic years and finished in the Renaissance. A history of architecture and Italian beauty thus exists in this group, from the Gothic cloisters up to the strange-looking Renaissance storeyed tower set at the crossing in the church, and the marvellous gleaming front. This façade of marble, which has mellowed very beautifully, added to the Gothic church by Borgognone, is one of the triumphs of the early period of the Renaissance. A wealth of art was spent on the carved doors and on the interior decoration. One of the finest of the Certosa monuments is that to Ludovico Sforza and the lovely Beatrice d'Este, by Solari.

Northern Italy during the Renaissance years was like a great forest where art lovers

could wander happily for years, finding constantly new beauties, large and small.

The great main growth of the movement came to maturity in Rome and Venice. Here the personalities of two architects dominated the work—first Bramante and then Michael Angelo.

THE MASS OF TOWERS AND SPIRES IN A GOTHIC BUILDING

Bramante, who was born at Urbino in 1444, two years before the death of Brunelleschi, saw all the possibilities of the new style, and in his work we can see its development. We can also see now at a glance the difference between a town which loved the Gothic style and one which loved Renaissance.

The sky line of Gothic buildings was a mass of mounting spires and towers and pinnacles, every line in the masonry carried as high as it would go. The sky line of Renaissance is a long horizontal bar, either a heavy cornice like that of the Riccardi Palace, for instance, or an open balustrade, like that of the Capitol at Rome. The ceilings of Gothic buildings were a mass of intricate vaulting; in Renaissance we find horizontal ceilings, panelled and moulded or simply arched. The tower of the Gothic church gave place to a dome at the crossing. We can see this at once by comparing St. Paul's Cathedral with Westminster Abbey. Renaissance windows were very simple and much smaller than those of Gothic buildings; they were square-headed or round-headed, sometimes round-headed in a square frame—a feature which Bramante treated with great refinement—sometimes square-headed surmounted by a triangular pediment, a feature which has become very common in so-called classical buildings of modern times.

THE PLACE OF THE PILLAR IN THE WORK OF THE RENAISSANCE

The use of the Orders, either as pillars or pilasters, which, we remember, are the fronts of pillars fastened to the wall as an ornament, became the strongest characteristic of Renaissance work. And the more the columns struck the simple, vertical line, the more the courses of the storeys and roof struck a powerful horizontal line. On the basis of this severe plainness of structure a great deal of ornament of all kinds was laid.

Bramante, his pupils and assistants, are responsible for a large number of buildings that rose toward the end of the fifteenth

century and in the first half of the sixteenth century. His youthful training as an artist was under Mantegna, as an architect under Alberti. Bramante's early work is at Milan; there he built the churches of St. Satiro and St. Maria delle Grazie. Two very beautiful pieces of sacred architecture by Bramante are at Rome—the cloister, with its two-storey arcade, of St. Maria della Pace, and the tiny circular church, a miracle of taste and proportion, called the Tempietto, in St. Peter in Montorio.

Of Bramante's work on St. Peter's and the Vatican we shall be thinking presently. Apart from that his most famous secular buildings are the Cancelleria Palace and the Giraud Palace, Rome. It was Bramante's assistant, Sangallo, who planned in 1534 what is probably the greatest house of sixteenth-century Renaissance—the Farnese Palace, Rome. Part of it was erected under Sangallo's supervision; Michael Angelo added the third storey ten years later. One of the chief beauties of the Farnese is its huge, unbroken cornice, like those of the Florentine palaces.

THE WORTHY STUDENTS WHO FOLLOWED A GREAT MASTER

The chief of Bramante's pupils and followers are Peruzzi and the great Raphael, Bramante's nephew. To these men the master handed on his scholarly tastes and his admirable restraint; most of the work they produced is worthy of the Bramante tradition. Peruzzi built, among other things, the Villa Farnesina, which Raphael helped him to adorn with frescoes. Raphael was responsible for certain parts of the Vatican, for the front of St. Lorenzo in Miranda, and the Villa Madama, Rome, and the Pandolfini Palace, Florence, which was built after his death, and is supposed to be his best architectural design. Raphael was also consulted about St. Peter's by the Pope, but it does not appear that he took any active part in the construction of the great church.

Giulio Romano, the painter, was one of Raphael's pupils, and builder as well. His finest piece of architecture is the Del Té Palace, Mantua, a wonderful one-storey building. When it was set up Giulio had the pleasure of painting some of the frescoes himself.

In the latter half of the sixteenth century some extremely interesting work was done by Barozzi da Vignola, who appears to have divided his time between Italy and

France, and also found leisure to write a book which was important to students of that century, *The Five Orders of Architecture*. Among Vignola's chief buildings were the church of St. Andrea and the Gesù Church, Rome, the Farnese Palace, Caprarola, and the Villa of Pope Julius, now the Etruscan Museum, Rome.

THE BIGGEST GROUP OF ARCHITECTURE IN THE WORLD

In the Vatican and St. Peter's all the grandeur of Roman art and history foregathered; with the Piazza they make the hugest, most famous group of architecture in the world. The Vatican is called the Palace of the Popes, but the Pope only lives in one corner of it.

This huge edifice was not set up in any one period: centuries have gone to its forming. The first bit of the Vatican, adjoining the ancient basilican church of St. Peter, was built at the end of the fifth century. About the year 1200 this fragment was reconstructed; the first additions were made by Pope Nicholas III eighty years later.

During the fourteenth century the popes made their home at Avignon, in southern France. They built a magnificent fortress-palace there, and sent for Italian painters to decorate the walls. In 1377 they returned to Rome, and at once it seemed an interest in art and architecture was aroused in the great city. Presently one of the popes caused a passage to be built on arches connecting the Vatican with the Castle of St. Angelo, whither, during the terrible sack of Rome in 1527, Pope Clement was glad to flee.

HOW THE VATICAN GREW AND GREW THROUGHOUT THE AGES

Bit by bit the palace was added to, each ruler trying to leave his stamp on it. Pope Sixtus built the Sistine Chapel, of whose decorations we read on page 696; Alexander added the Borgia Tower. In the reign of Leo, and the warlike Julius who swung his sword, so to speak, through so many artists' lives, Bramante added his famous parts—the court of St. Damaso and the Belvedere Court; and Raphael decorated his gallery and rooms. A later pope caused Sangallo the architect to add the Pauline Chapel and other apartments. After that the palace was widened, Bramante's courtyard being added to on the eastward side. Addition after addition came, courtyards and magnificent staircases and galleries, and at last the Vatican

had about a thousand rooms and was finished. It is now a treasure-house of art, containing the largest collection of classic sculpture in the world.

In 1505 Pope Julius was taken with an idea of building a tomb house for himself; from it grew the largest church in the world, St. Peter's, Rome. In order to clear the way, Julius had the old basilican church pulled down (this had been built by Constantine in 330 near the place of St. Peter's martyrdom in Nero's circus) and then he invited all architects of note to compete for the work of the new building. The drawings and sketches made for this monument are now treasured in the Uffizi, Florence, and they show, if we had no other evidence, what a wealth of art there was in Italy in those days.

Bramante's design was chosen, and in 1506 the foundation stone laid. His plan was to build St. Peter's in the form of a Greek cross with a huge dome like that of the Pantheon, and a tower, in stages, of most beautiful work, at each of the four points of the cross.

THE ARCHITECTS WHO TRIED TO UPSET THE PLANS OF BRAMANTE

Seven years later Julius died, and his successor called in Sangallo, Fra Giocondo, and Raphael, who naturally did not agree with Bramante, being architects themselves. The work of the first two was finished before they could alter much of the magnificent work Bramante had begun. Raphael suggested that the Greek cross plan should become a Latin cross, which, considering the proportions and general mass of the building, was a stupid suggestion. After Raphael's death Peruzzi was then made architect, and he liked the Greek cross formation. So, one way and another, the church grew.

Troubles within and without disturbed both the building and its advisers. The work had to stop for want of money; then war cast its shadow across the climbing walls; the sack of Rome, that seven months' horror, came. Peruzzi died in 1536, and Sangallo the Younger became architect to St. Peter's in his place. It seemed that no man could go on with the plan originally accepted; each had to make his mark in some way, and build, or try to build, a St. Peter's of his own. Sangallo proceeded to work according to his plan; but before he could finally spoil the building death in turn took him. And then on to this stage of many actors

THE RENAISSANCE IN ITALY

strode Michael Angelo, genius, master, who had, as we know, played many parts.

The master was seventy-two, but not too old to fire guns. Slip-slap, to right and left, was shot the work of other men. Once more Bramante's plan of the Greek cross was reverted to, these two geniuses meeting on this point of taste. As such the church was carried on, but Michael Angelo added his own treatment of chapels and apse. His work was vigorous and sane, and he began constructing the huge dome in a daring manner which has been the amazement of architects ever since.

THE ONE IDEA OF BRAMANTE WHICH NOW REMAINS IN ST. PETER'S

It is impossible to read the tale of the building of St. Peter's without wishing very sadly that either Bramante or Michael Angelo could have made a finished work of it, or, at any rate, that after the architect's death his very able plans might have been carried out. There is very little left of the original, exquisite, and restrained design Bramante made now, save the idea of the dome. For in 1564 Vignola added cupolas in place of Bramante's towers, and Maderna, an architect of the early seventeenth century, for the last time contested the Greek cross plan, pulled out the nave to make it in form a Latin cross, and added the chief front.

The last architect to make his mark on St. Peter's was Bernini. He built the magnificent entrance piazza, a great, wide, circular sweep, with its fourfold arcade of huge pillars. This fine empty space before the chief façade is of the most wonderful value, as it frames and sets back the great church. St. Peter's is an awe-inspiring sight, and quite half of the effect, to the approaching visitor, standing by those immense pillars, is caused by the sweep of Bernini's piazza.

Everything about St. Peter's is huge. The dome is twice as high as the towers of Westminster. The pillars that run round the actual building are immense. The church's interior is almost oppressive in its magnificence.

THE MEN WHO COPIED THE STYLE OF MICHAEL ANGELO

Michael Angelo had done many other architectural works before he touched St. Peter's. His labours were varied, from the staircase at the Biblioteca Laurenziana, Florence, which Vasari finished from his design, to the Medici Mausoleum. His

greatest civic building was the Capitol at Rome. Another work of his in the great city was the turning of a Roman bath house into the church of St. Maria degli Angeli.

After Michael Angelo another change came over Renaissance architecture in Italy. The great genius had a number of followers who imitated his restless, tormented grandeur, and could not by their smallness get at the strength that underlay it. In the seventeenth century architects began to have a horror of simple, classic lines, and they felt that the more curves a building had the better it was. To this period, that of the degeneration of Renaissance style, which corresponds in architectural history with the last eccentricities of Gothic, the name of Baroque or Rococo has been given. It is, as the reader will guess, not a good architecture. But in spite of its inherent weaknesses some interesting Baroque work was produced in Venice and the neighbouring towns.

THE GLORY OF VENICE IN THE FIFTEENTH AND SIXTEENTH CENTURIES

In Venice, fairy town set in the sea, palaces of dazzling beauty mark the Renaissance period. Like Florence, she was an independent power and had much wealth which she joyfully expended in the interests of art and architecture. Palaces arose in the Gothic and Renaissance period as a matter of course, just as nowadays, in a thriving English town, huge shops would appear. The standard of the Venetian was high; nothing paltry or cheap was allowed to appear; we can scarcely conceive of the glory of fifteenth and sixteenth-century Venice.

The city had of course an allure of her own, which, apart from the strong, individual taste of the Venetians, gave a distinction to her architecture. No other Italian palaces were lapped by tides which flung up an added radiance into the sun's light and drew down the lines of walls and doors in long, wavering reflections, and painted them in the richness of colour that tranquil water alone can give.

It was because sky and sea made such a glory of the marble lines that Venetian architecture in the years of wealth became so decorative. Surface ornament was peculiarly rich in the Baroque period, too rich. Balconies flung out their traceries against the gleaming walls; cornices running the length of the storeys laid bands of blue shadow on the palace fronts.

We have already noted, in mentioning St. Mark's, how independent was the Venetian spirit. When Renaissance architecture rose in the city her artists and architects created not only this rich surface effect, but they had an art of grouping their windows which is very pleasant and sets them apart from other Italian palaces of the period. They liked a cluster of window forms in the middle of a façade, with the bare wall on either side making the group appear all the richer by contrast.

**THE LOVELY CITY THAT STANDS
ON A NETWORK OF CANALS**

To go along the Grand Canal, which is the main street of Venice, almost lined with palaces, and across the wonderful Rialto Bridge, is to receive an unforgettable lesson in the Venetian genius.

As in other Italian towns, it was often difficult to decide whether a Venetian's work entitled him more to the description of architect than sculptor. The two arts almost always went together; many men have laid the stamp of their dual gifts on Venice. In the sixteenth century two great names stand out, the gifted Lombardi family and Jacopo Tatti, generally known as Sansovino. To Pietro Lombardo is due, among other notable works, the lovely marble church of St. Maria dei Miracoli, one of the most exquisite things the Renaissance produced in Venice. To Sansovino, again among other notable works, the city owes the Library of St. Mark, the greatest civic building produced in Italy in this period. St. Mark's School, now a hospital, was built by one of the younger Lombardi.

**THE MAGNIFICENT PALACE WHICH USED
UP THE LABOUR OF CENTURIES**

Many architects were concerned in the most famous house in Venice, the palace of the Dukes, or Doges. Like the Vatican, it took centuries to grow. It was begun early in the ninth century, was twice burned down and rebuilt, and suffered many alterations. The façades date from the Gothic period (Bartolommeo Buon was responsible for some of this early beauty) and each successive generation added something. The great courtyard with its arcade is one of the most delightful things in Italy, and is unique in the architecture of its period.

The palace is built of various kinds of marble, in some parts rose and white blocks making a pattern of colour which,

added to the open tracery and richly-carved columns, gives an exquisite effect. In due course Pietro Lombardo was employed on the palace, and after him Bergamasco, and, later, Scarpagnino, another architect. From the courtyard rises the famous Giant's Staircase, and here Sansovino, working in the capacity of sculptor this time, placed the fine figures of Mars and Neptune. Paul Veronese and Tintoretto painted some of the walls and ceilings of this famous palace; its doorways and chimney-pieces are wonderfully carved. At every third step, it seems, one is confronted by a great work of art. The Bridge of Sighs, its gleaming shape hung over the narrow waterway, connects the palace to the prison.

The last great architect of the later Renaissance was Andrea Palladio, a man of great gifts who has had a considerable effect on Europe from his day to our own. Some of his works were carried out in Vicenza; many were begun, but did not reach completion.

**THE FINE THINGS PALLADIO MADE
FROM HIS POOR MATERIAL**

Palladio had often to build in poor material, like brick faced with stucco, and it was a mark of genius that out of such commonplace material he should have created works of art. He published a famous work on architecture which contained a history and description of buildings since destroyed, and also designs for his own buildings.

Palladio built many palaces in Vicenza, and added the famous arcades to the old basilica in that town. One of his best-known works was the Redentore Church, Venice.

Soon after Palladio's death buildings of the Baroque style began to be seen. Probably the most famous of all Baroque buildings is the St. Maria della Salute Church in Venice, built by Longhena. Bernini, whose piazza for St. Peter's we have already mentioned, was a Baroque architect, one of many who laboured in Italy, not altogether for its good, in the seventeenth century.

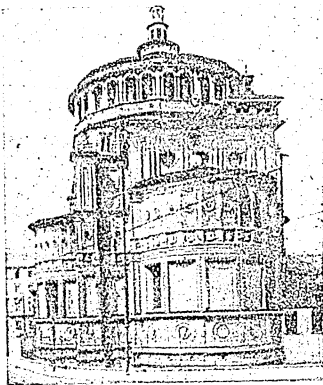
All countries and races have to pay the price of a great period in art by the poor work which inevitably follows it. And perhaps we can appreciate pure Renaissance buildings in Italy all the better because we are obliged to pass by so much that is unworthy of them.

GREAT BUILDINGS OF ITALY

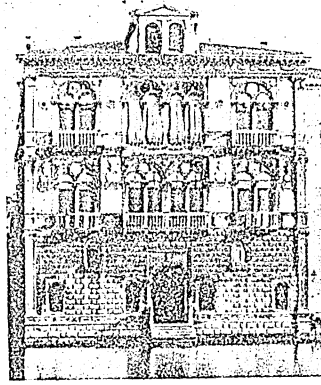


THE BEAUTIFUL CHURCH OF SANTA MARIA DELLA SALUTE ON THE BANKS OF THE GRAND CANAL IN VENICE

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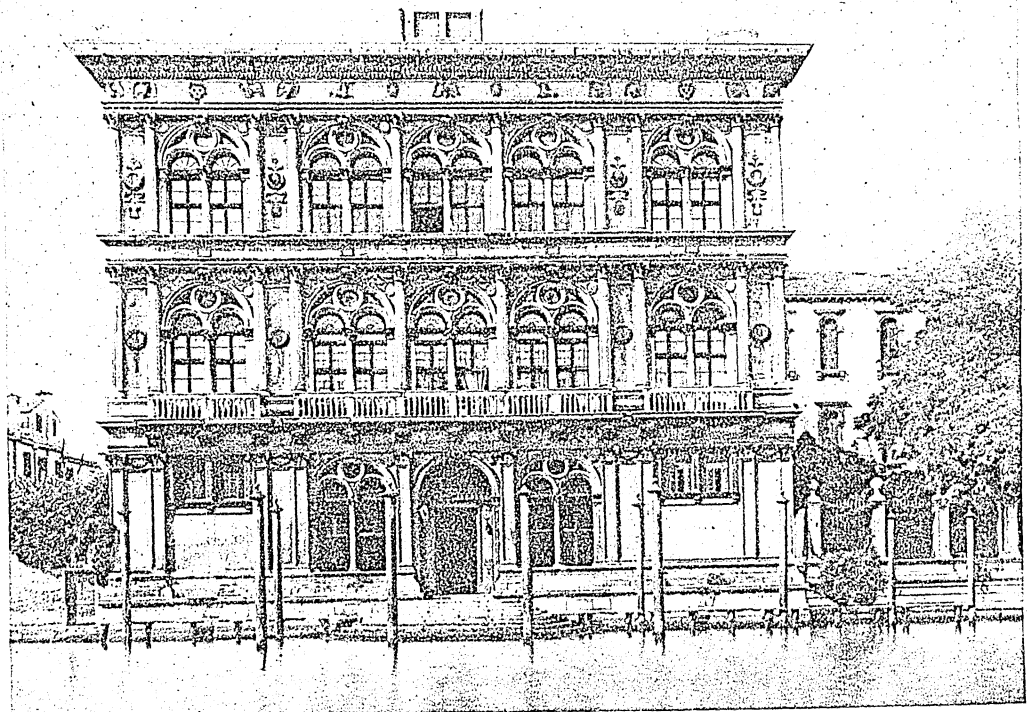
ST. MARIA DELLE GRAZIE, MILAN



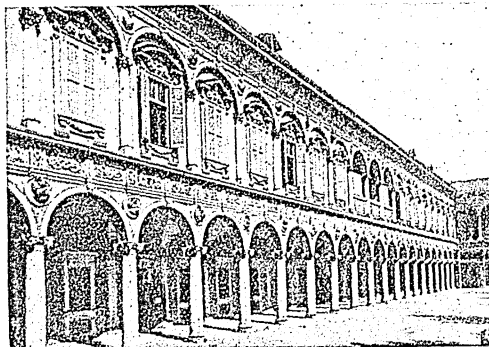
SPINELLI PALACE, VENICE



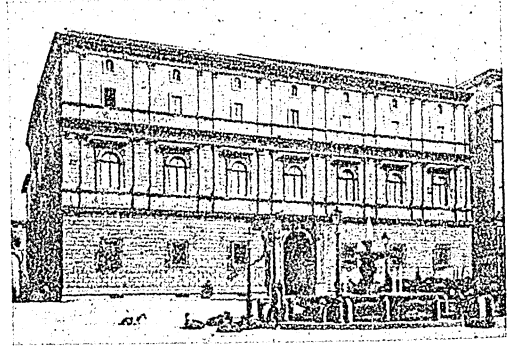
ST. MARIA DEI MIRACOLI, VENICE



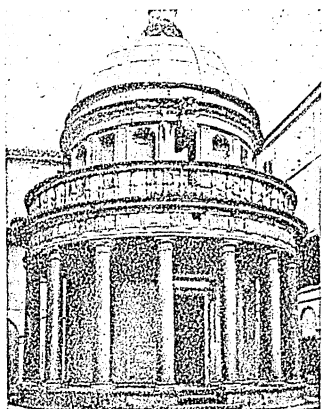
ONE OF THE SPLENDID PALACES ON THE GRAND CANAL IN VENICE



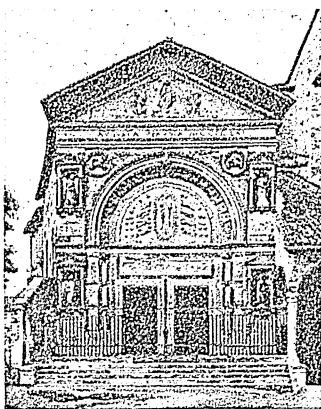
COURT OF THE MAGGIORE HOSPITAL IN MILAN



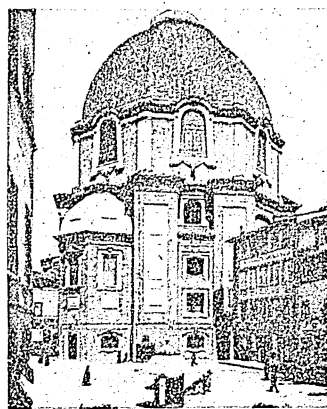
THE GIRAUD-TORLONIA PALACE IN ROME



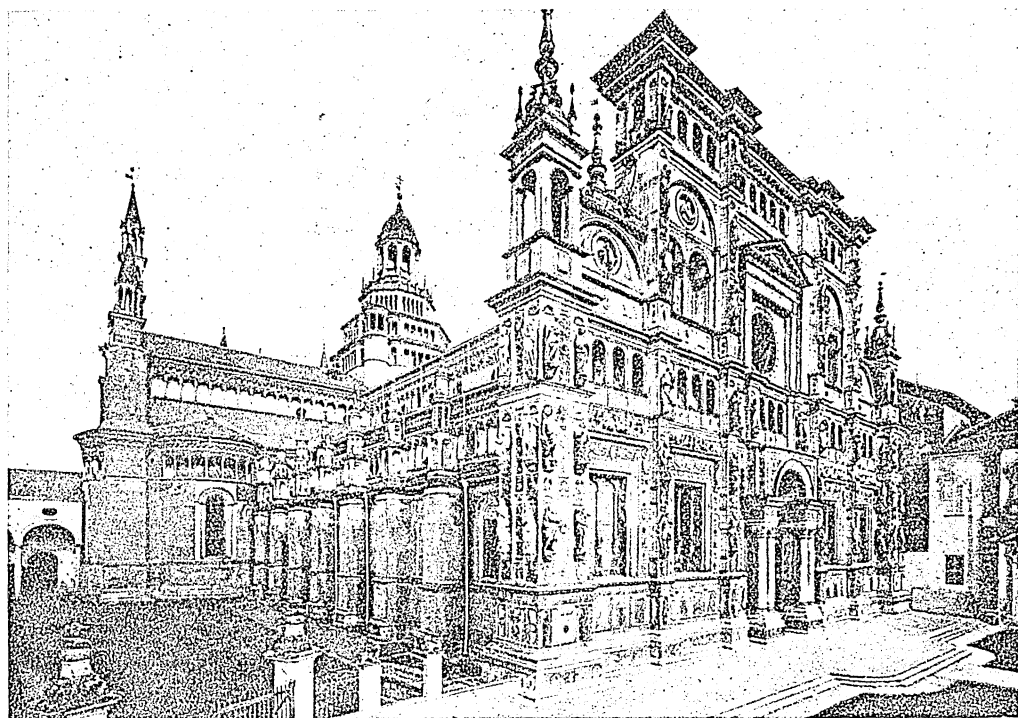
TEMPLE IN THE CHURCH OF
ST. PETER MONTORIO. ROME



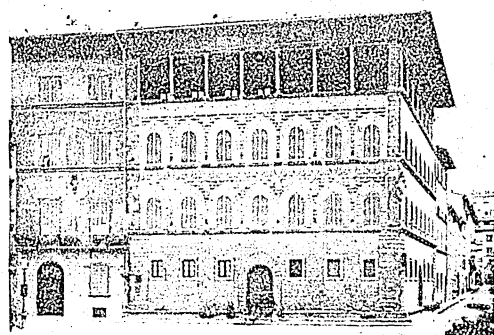
SAN BERNARDINO CHURCH.
PERUGIA.



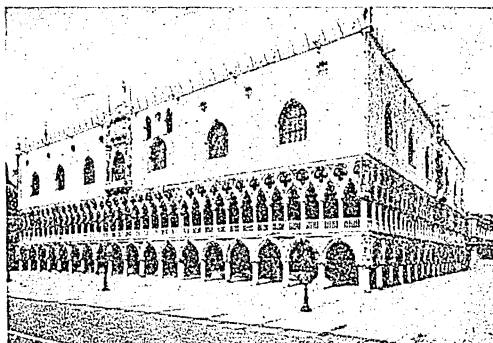
THE FAMOUS MEDICI CHAPEL
IN FLORENCE



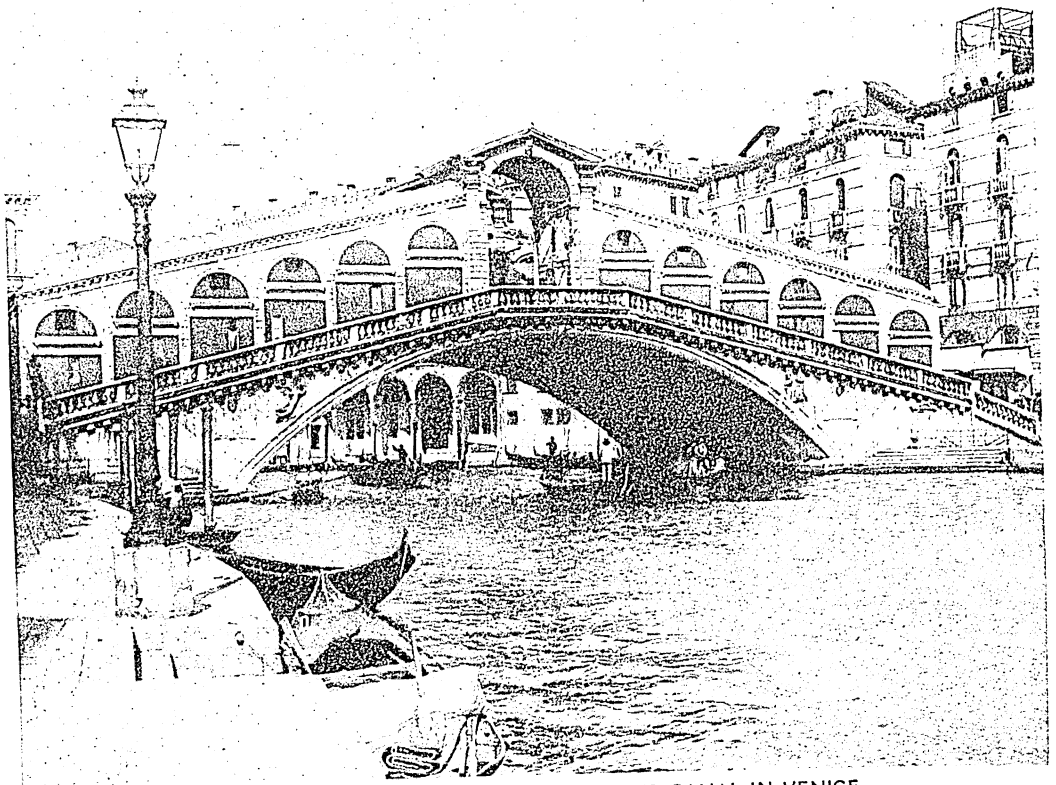
THE CERTOSA OF PAVIA. AN OLD CARTHUSIAN MONASTERY. NOW A NATIONAL MONUMENT



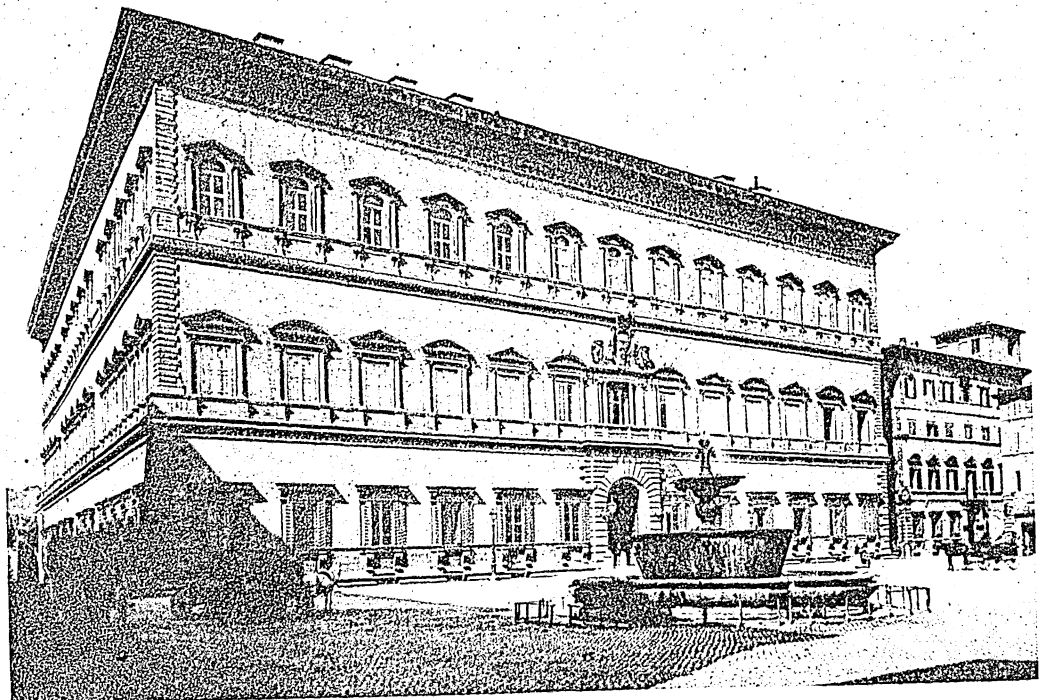
THE GUADAGNI PALACE IN FLORENCE



THE PALACE OF THE DOGES IN VENICE



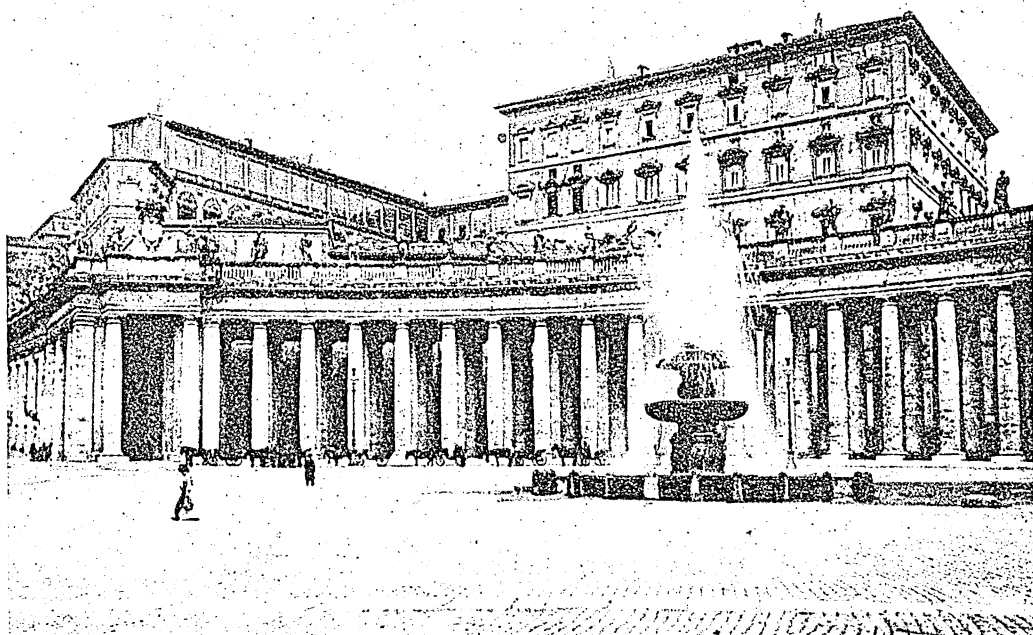
THE RIALTO BRIDGE ACROSS THE GRAND CANAL IN VENICE



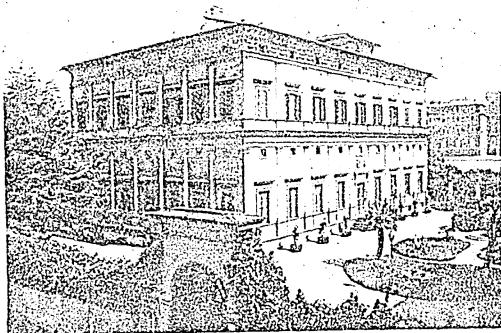
THE FARNESE PALACE IN ROME, WHICH MICHAEL ANGELO HELPED TO BUILD



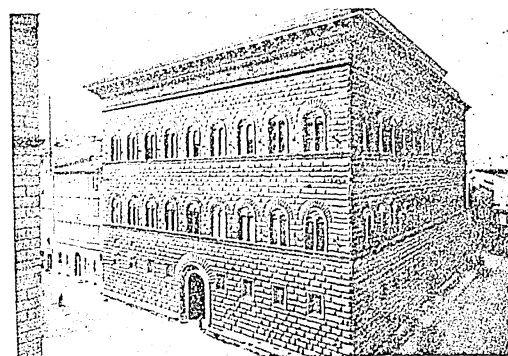
ST. PETER'S IN ROME, THE BIGGEST CHURCH IN THE WORLD



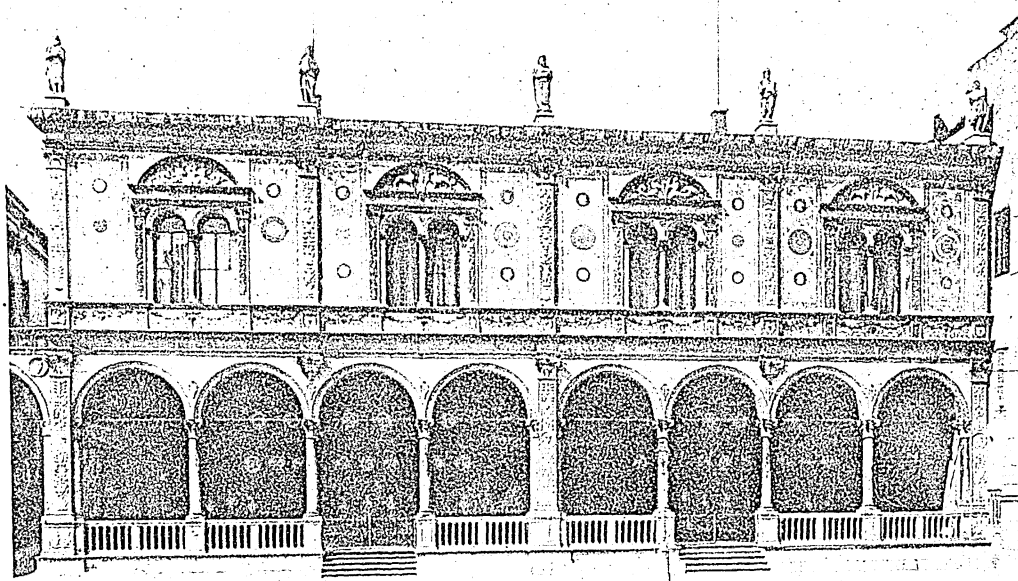
THE VATICAN IN ROME, SEEN FROM THE COLONNADED SQUARE IN FRONT OF ST. PETER'S



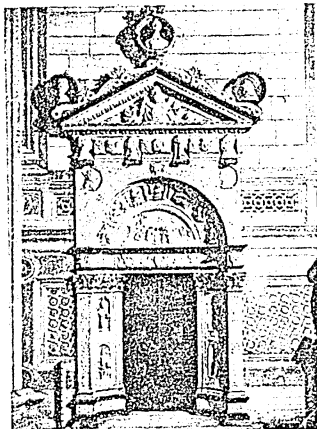
THE VILLA FARNESINA IN ROME



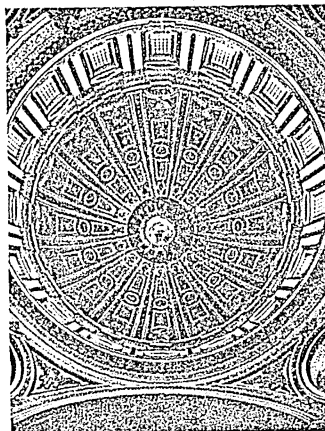
THE GREAT STROZZI PALACE IN FLORENCE



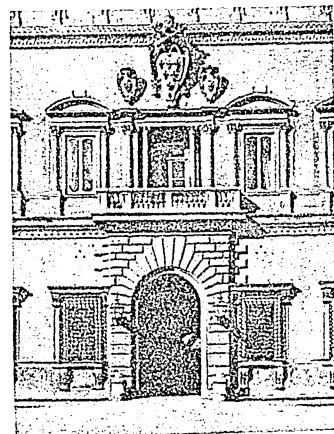
THE OLD TOWN HALL OF VERONA



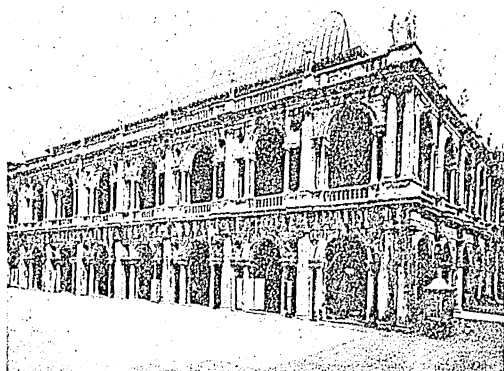
A DOORWAY OF THE FARNESE PALACE, ROME



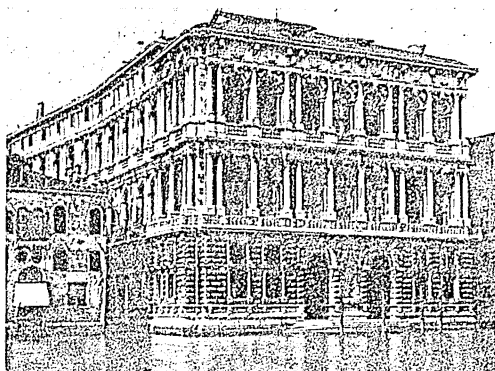
LOOKING UP INTO THE CUPOLA OF ST. PETER'S



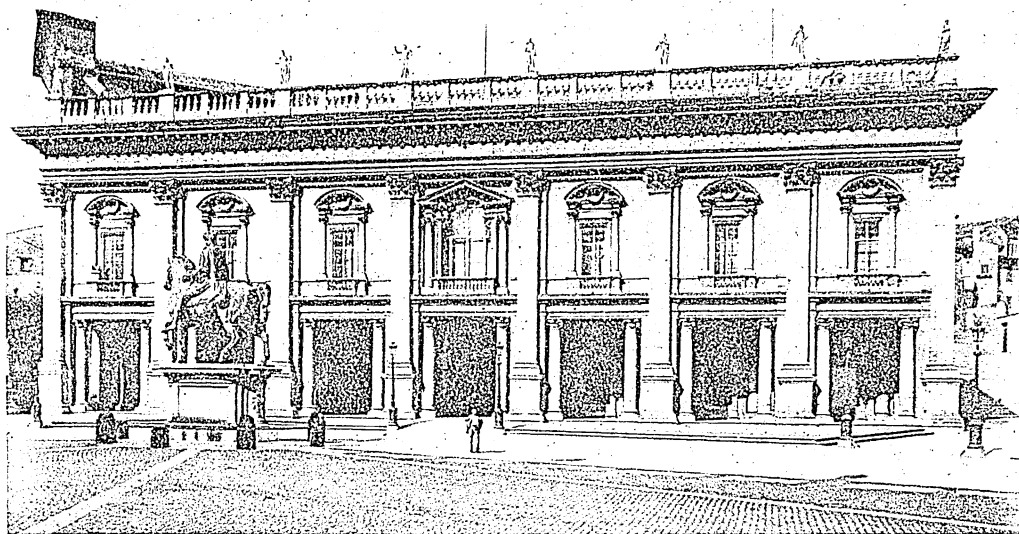
A DOORWAY OF THE CERTOSA OF PAVIA



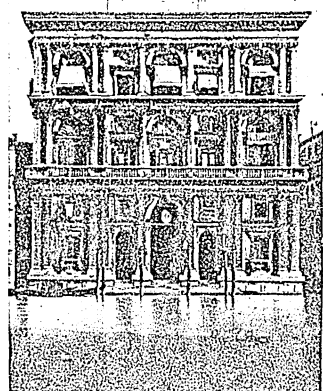
THE BASILICA PALLADIANA AT VICENZA



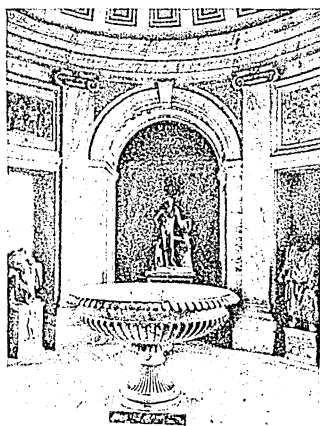
A PALACE ON THE GRAND CANAL IN VENICE



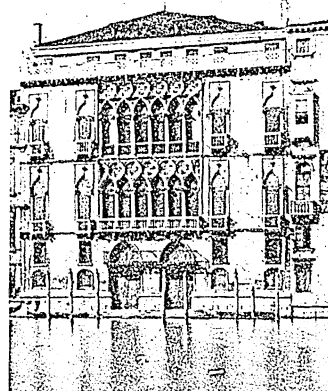
THE PALACE OF THE CONSERVATORI IN ROME



GRIMANI PALACE IN VENICE



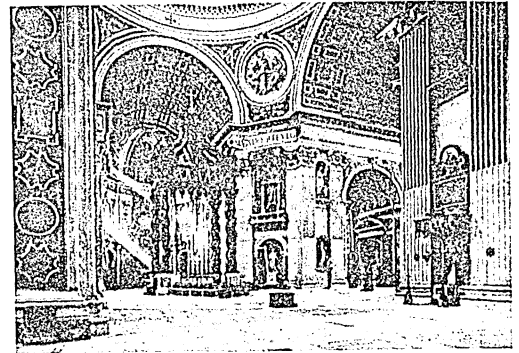
A HALL IN THE VATICAN



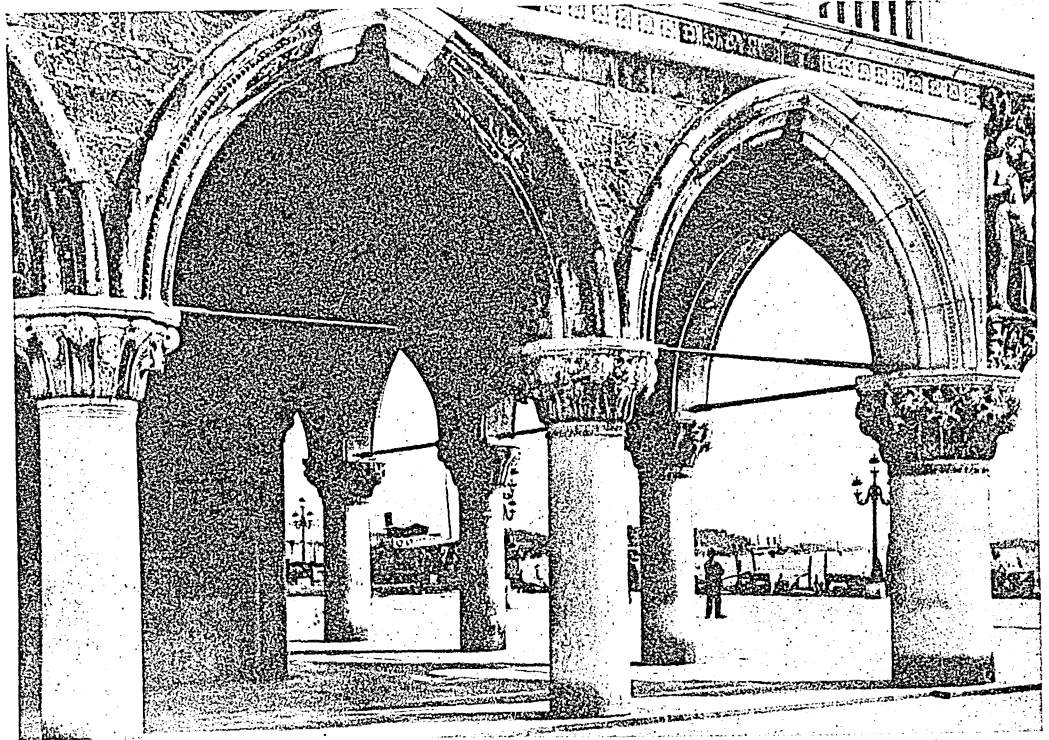
PISANI PALACE IN VENICE



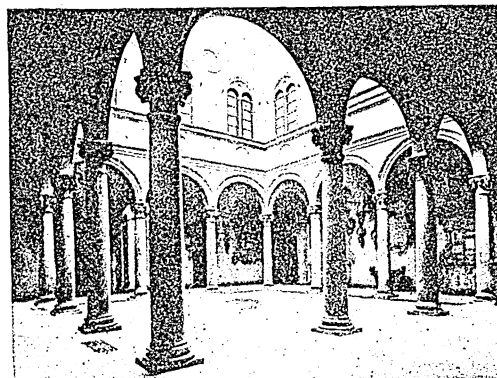
A GALLERY IN THE RICCARDI PALACE,
FLORENCE



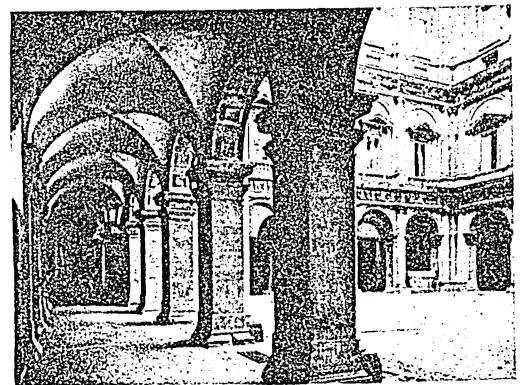
THE BEAUTIFUL INTERIOR OF ST. PETER'S
IN ROME



THE ARCHES OF THE PALACE OF THE DOGES AT VENICE

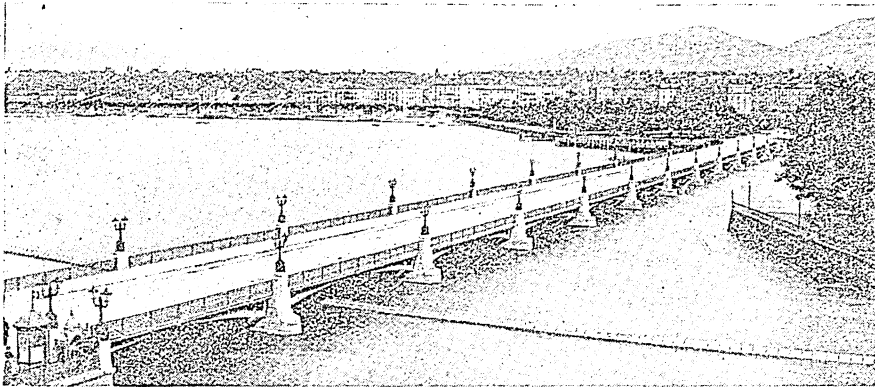


A COURT IN THE RICCARDI PALACE, FLORENCE



A COURT IN THE FARNESE PALACE, ROME

The Wonderful House We Live In, and Our Place in the World



Mont Blanc Bridge across the Rhone at Geneva the seat of the League of Nations

COOPERATION

ALL we have learned about the production of wealth leads to the conclusion that men, by working together, can do far more for themselves as individuals than by working against each other. This principle of working together we call cooperation.

Cooperation, while it means combined effort, does not mean the loss of individual character, initiative, enterprise, or effort. If it did it would be valueless, because it is necessary that the powers of every boy and girl, of every man and woman, should be fully developed. It would be a bad thing for industry, trade, and society if individuals merely worked like cogs in a machine, without knowing why they were at work, and without any responsibilities for their actions.

There is no better way of illustrating the true conception of cooperation than by a cricket team. As every boy and girl knows, it consists of eleven players. The eleven go into the field to play the game, as we say. It is "cricket" to play for your side and not for yourself. The game is instinct with fair play. It is a matter of concerted, combined, or cooperative effort between eleven individuals, each with brains of his own, powers of his own, and ideas of his own. Each player desires to succeed. Each looks forward to leaving the

field after having scored something as an individual. Each gets individual pleasure out of the contest.

How is it done? How is it that each cricketer gets a good game as an individual while the first principle of the game is to study the interest of one's side and not of oneself? The answer is, first, that the game has definite rules, which each player consents to obey. These rules make the very life of the game. It is because each player obeys the rules that each player gets his pleasure. There would be no pleasure if there were no rules. For example, if there were no rule as to the width of the bat a batsman might produce a bat eight inches wide, plant it in front of his wicket, and defy anybody to get him out. If there were not a rule, which each player consented to observe, that the ball should be of a certain size and weight, and that it should be bowled and not thrown or mechanically propelled, a bowler might turn up with a very big ball projected by a machine, and so make play a mockery.

Then, also, each member of the eleven, in addition to obeying the general laws of cricket, also agrees to obey the captain. This captain appoints the members of the team to their places in the field, according to their individual abilities, and decides the order in which the batsmen shall go in.

BODY, MIND, AND SOUL · CITIZENSHIP · ECONOMICS · GOVERNMENT

By obedience to these commands each member of the team gets his best individual chance. If he is a fast runner, and can pick up and throw well, he gets his chance in the deep-field. If he has a natural and effective break he is put on to bowl. If he is exceptionally quick of eye, and smart in snapping balls off the bat, he keeps wicket or is placed in the slips. If he is a bad fieldsman, and yet a first-class bat, he is put at mid-on, but goes in to bat early in the innings. So we see each player given individual opportunity in which he can distinguish himself, and yet at the same time finding his pleasure, not merely in individual effort, but in what is truly cooperative work.

The best results in work are obtained in the same spirit of enlightened self-expression. In mutually directed efforts individuals can find the most complete satisfaction of their own working powers. Happiness, as well as fruitfulness in work, follows such cooperation. Doing his best in cricket, the player enjoys not only his own efforts, but the approval and the esteem of his fellow players. Doing his best in cooperative work, the worker can gain for himself precisely the same individual and social happiness.

TRADE THE SERVANT OF THOSE WHO ARE ITS CUSTOMERS

In analysis, all the varied occupations which are carried on within our country are cooperative so far as they are useful. In the long run, no trade or industry can survive unless it meets the needs of a number of people sufficient to sustain it. Whether a man sees or not that the trade he carries on is really a servant of those who are its customers, it is nevertheless true that that trade is part of a scheme of service. It is curiously true that sometimes a man who imagines himself to be a most selfish creature, who thinks of nothing else but of looking after, as he would say, Number One, is really working hard all the day and all the year to serve others, and leaving himself very little leisure in which to do anything for himself.

Fortunately, people are becoming more and more conscious of the mutuality of work—of how one occupation is dovetailed with another, of how trades depend on each other, and of how necessary it is for all the individuals working in a trade to have harmonious relations.

Thus we see the members of industries working together in trade associations,

which have central offices and meeting-places where, from time to time, they discuss the progress of the trade, how to make improvements in its products or its methods, and how best the general interest of the whole of the members can be served by individual action just as at cricket.

THE PARLIAMENT OF INDUSTRY WHICH WOULD HELP THE NATION'S TRADE

We see also the workers in industries drawn together in trade societies, which are formed to help the whole body of workers. No doubt, as time goes on, these will be more and more closely associated with the actual governors of trades, so that an industry will become a body cooperative within itself, and a conscious servant of the public. Whether it knows it or not, a trade is a public servant, and the more it is conscious of the fact, the better for the trade and for the nation of which it is a part.

The suggestion has been made, and is more and more heard of, that work should be aided by a Parliament of Industry. It would be representative of both employers and employed, and its main principle would be the idea of cooperation between all trades in the national interest for the production of more wealth under healthy and harmonious conditions. It would prevent disputes by helping people to understand each other. It would help every trade to see that it is part of a working whole, and that if one trade fails, or stops work, it injures all other trades.

We can imagine such a body meeting, with its hundreds of members representing every trade, large and small. They would discuss the national position in its relation to the work of the world, the part each trade played in making our people happy and comfortable, questions of method, prices, profits, wages, hours of labour, and how to make work safe, interesting, and agreeable.

THE GREAT OPPORTUNITY THAT COMES TO THE CHILDREN OF TODAY

So each working section of the nation would come to understand and appreciate the others. Here, surely, is a great idea for children to grow up with, so that, when they come to take part in the serious business of life, they may try to understand what a wonderful thing the work of a great nation is, and help to make it better, happier, and more fruitful.

Among the things in which there has been more and more cooperation in work

COOPERATION

is the effort to make occupations safer for those who work in them. So a "Safety First" campaign has arisen. More care is taken than of old in safeguarding workers from being killed or injured by faulty appliances, by bad methods, or by unguarded machinery.

There is also the question of making work-places clean, well-ventilated, and comfortable as well as safe. Many good employers now provide those who serve them with fine rest-rooms, dining-rooms, lockers, and lavatories. It is also becoming more and more widely understood that if work is done under the best conditions, in roomy places where there is plenty of light streaming in from large windows, where there is ample space in which to move about, and where the air is not too cold in winter or too hot in summer, far more wealth can be produced by the same amount of effort than in unhealthy, badly arranged, crowded work-rooms. All these things, too, are expressions of enlightened self-interest, of cooperative endeavour, of the heartening and noble conception that work, being an essential part of the daily life of the world, should be treated in terms of common humanity.

HOW LOCAL TRADE CONDITIONS AFFECT THE COUNTRY AS A WHOLE

But it is not alone in our own country that we have to consider this important principle of cooperation.

If we remind ourselves of the history of what we now call the British Isles, we know that not very long ago our islands, small as they are, contained nations which warred fiercely upon each other. Now we are able, fortunately, to regard them as being one cooperative whole in the matter of work and trade. We do not make the mistake of thinking that if someone in Scotland gets an order for business it is bad for someone in England, or that if Wales makes progress it is bad for the county of Kent. We know quite well that nothing could be better for England than that Scotland should be prosperous, and that London is not better off, but worse off, if Lancashire suffers in trade. In the old bad days these commonsense truths were not realised. There was a time when people in England thought it bad for them if Ireland did good trade.

The Great War has helped many people to see that what is true of trade inside the British Isles is also true of the trade of the world as a whole.

With our European Allies and America we were victorious in the Great War, and the German Empire, the Austro-Hungarian Empire, Turkey, and Bulgaria suffered crushing defeat after four years of warfare. The British Empire, France, Belgium, Italy, America, and their Allies were triumphant.

WHY THE WORLD BECAME POORER AFTER THE GREAT WAR

What was the effect upon trade? Did the victors find a great prosperity in their conquest? Are our people, or any people in the world, whether they took part in the war or whether they did not, better off?

We know that every country in the world is far worse off than before the beginning of the great conflict. The victors are suffering as well as the vanquished. Old trade connections, which were built up after centuries of effort and development, were broken. Men in different countries ceased to have faith in each other's power to meet their bills. Traders no longer believed in each other's credit. So a large part of the trade by which the world lived disappeared, and all the world became poorer.

It is possible to sum up all this quite truly in a few words by saying that after the war the world was poorer, and we were poorer with it, because the world had ceased to cooperate as fully as it cooperated before the war began.

World trade, which means so much to Britain, is in essence just as much a scheme of cooperation as is trade within our own borders. We buy abroad and sell abroad for precisely the same reason that people in England or Scotland buy or sell in Scotland or Wales. Trade is not a one-sided thing, but a matter of mutual interest. If we buy sugar from or sell yarn to Germany, it is good for both Germany and ourselves. If we buy iron-ore from or sell engines to Spain, it is good for both Spain and ourselves.

THE CIVILISING EFFECT OF TRADE BETWEEN NATIONS

World commerce, as it was before the war, amounted to a redistribution of goods and services all over the world, which made for the comfort and prosperity of every part of it. Nothing is more unwise or untrue than to regard trade as a sort of warfare. If a ship leaves a British port, taking railway material or cloth or coal to some foreign country or British possession, it is not a deed of cunning,

OURSELVES

nor do the goods bombard the place to which they are taken. They go out because they have been bought by someone to whom they will be useful, and when we export to a nation we serve that nation even while we serve ourselves.

So it is with imports. The nations or British Dominions which send us goods do not injure us. On the contrary, we buy abroad what we need, and when the purchases arrive they serve us, just as our exports serve others.

Here is an account of the exchange of goods and services with the world at large by which we live:

IMPORTS THE WORLD SUP- PLIES TO US

Food, including corn, meat, dairy produce, fruit, vegetables, wine, tea, coffee, cocoa, sugar, and so on.

Raw materials, including ores, cotton, wool, jute, hemp, silk, timber, hides, skins, asbestos, india-rubber, gutta-percha, sulphur, oil-seeds, and so on.

Manufactured articles, including copper, brass, lead, iron, machines, yarns, oils, chemicals, dyes, wood-pulp, and so on.

Tobacco.

EXPORTS WE SUPPLY TO THE WORLD

Manufactured articles, including iron and steel, brass goods, engines, railway material, machinery, tools, electric goods, cotton goods, woollens and worsteds, jute goods, linen, apparel, hats, chemicals, boots, ships, rubber goods, earthenware, gloves, and so on.

Ship Services (that is, our ships carry goods for oversea nations).

Financial Services (our bankers work for people overseas).

Coal.

We could not exist as a great nation without the supplies we receive from abroad, for not only should we be without food for about one-half of our people, but most of our factories would be without the raw materials which are the food of work. An account of our imports is really an account of the services which the world performs for us. An account of our exports is really an account of the services we perform for the world. The two acts balance each other, and that is a matter of mutual benefit and an expression of cooperation.

We see how interdependent men are, and how interdependent nations are. A man trying to live for himself alone is like a boy "sent to Coventry," as we say. A nation seeking to be self-sufficing is really robbing itself of the advantage of belonging to a world which can serve it.

The progress of the world has arisen from the extension of commercial relations. It is by no means a thing to deplore that different nations have different natural resources, and that their peoples have varying attributes. It is the very variety of different lands and different peoples which gives savour to humanity, and interest to the intelligent man who surveys the globe.

HOW THE WORK OF MAN IS ALWAYS INCREASING IN VALUE

If we go back for no more than 150 years we have a picture of a world each part of which was almost entirely self-contained. Not very much trade was done then even within a country. Each little locality lived mainly upon itself. As a consequence, the average man could only exchange his work for that of a few people who lived about him. That meant that his work had quite a limited value to him. He could not, for example, change work, as we can, for bananas from the West Indies, or the products of farms in Denmark or America, or a beautiful ornament made in Paris, or cloth woven from wool brought from Australia. He was confined to the consumption of those things which either the natural fertility of local soil, or the native skill of his neighbours, could supply. However hard he worked, the results of his work were strictly limited in character.

How different is the lot of the civilised worker of today, who, by reason of the accomplishments of commerce, which rest essentially upon the wonderful work of the engineer in building railways and steamships, can exchange his work for such a variety of articles as could not be commanded even by the richest men 150 years ago! A workgirl can get for a penny a tropical fruit which kings had not tasted in 1750. A poor boy can go into a kinema, and see moving on the screen scenes of life in China which a European king of the old time would have given large sums of money to command.

THE PEACE THAT IS ESSENTIAL FOR THE MUTUAL SERVICE OF NATIONS

Thus the interdependence of nations is really the cooperation of nations, the mutual service of nations. In peace alone it can flourish, and the more fully we understand the need and value of this cooperation with the greater determination we shall apply ourselves to making it ever wider in its operations.



1. MARSH MARIGOLD 2. BLUE MARSH VETCHLING 3. HORSE MINT 4. YELLOW MEADOW-RUE
5. MARSH WILLOW-HERB 6. GREAT SUNDEW 7. KNOTTED FIGWORT 8. IVY-LEAVED BELLFLOWER
9. YELLOW MARSH SAXIFRAGE 10. MARSH PLUME-THISTLE



1. MARSH CINQUEFOIL 2. NODDING BUR-MARIGOLD 3. MARSH RED-RATTLE 4. WATER HEMLOCK
5. MEADOW CRANE'S-BILL 6. SMALL MARSH VALERIAN 7. MARSH CUDWEED 8. MARSH GENTIAN
9. MARSH VIOLET 10. MARSH ANDROMEDA 11. MARSH RAGWORT 12. PENNYROYAL 13. FLAX-SEED

FLOWERS OF THE STREAM

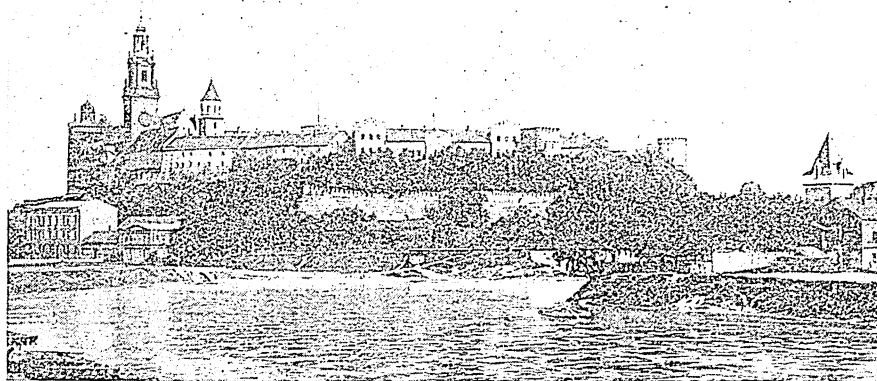


1. FLOWERING RUSH 2. YELLOW WATER-LILY 3. WATER MINT 4. BROOKLIME 5. GREATER SKULLCAP 6. COMMON COMFREY 7. WATER VIOLET 8. WATER BEDSTRAW 9. GREAT VALERIAN 10. MARSH YELLOW-CRESS 11. COMMON BUTTERBUR 12. YELLOW LOOSESTRIFE



1. YELLOW IRIS 2. SNAKE'S HEAD 3. LARGE-FLOWERED BITTERCRESS 4. WATER AVENS 5. MARSH WHORLED MINT 6. NARROW-LEAVED WATER PARSNIP 7. PURPLE LOOSESTRIPE 8. YELLOW MONKEY-FLOWER 9. WATER PLANTAIN 10. GREAT WILLOW HERB 11. MONEYWORT 12. PROCUMBENT MARSH-WORT

The Story of the Peoples of All Nations and Their Homelands



The famous castle at Cracow, the ancient capital of Poland

POLAND AND ITS PEOPLE

WHEN looking at the map of Central Europe we see a vast plain stretching from the Baltic Sea to the Carpathian Mountains. It is the cradle and home of the Polish Nation.

The Poles, like the Russians, Czechs, Serbs, and Ruthenians, belong to the Slav branch of the great Aryan race. No one knows when they settled down in Europe; but it is certain that the Poles of today are the direct descendants of the Poles of two thousand years ago. Even their language has not much changed, and the Pole of today could easily understand a Pole of the tenth century. The Romans never tried to conquer Poland, though they must have known it, as one of the Roman chroniclers mentions a country beyond the Carpathians where strange people lived who played the flute most beautifully, but did not know the use of a sword. Most of the Slavs were gentle and peaceful. They tended sheep and cattle, and were clever at bee-keeping and fishing. The women used to spin and weave their own clothing while the men hunted in the big forests.

In some parts, where the old forests were cleared, men used to till the ground, using primitive wooden ploughs. Slav territories reached as far as the Rhine in Germany of today, but unhappily those peaceful people had German neighbours who loved

war and conquests. They wanted to have the rich land of the Slavs.

To appear disinterested they proclaimed a crusade against the pagan Slavs. Whoever rejected Christianity was killed, and his land was taken by Germans. They pushed their frontier farther and farther eastward, until their advance was stopped by the Poles.

The threatening danger of a German invasion taught the peaceful shepherds of the Polish plain to use weapons and to organise their country under one leader. There is a legend of a Polish princess Vanda who preferred to drown herself in the River Vistula rather than marry a German knight who wanted to get hold of Poland by marrying the prince's daughter. Her father founded Cracow, the old capital of Poland, and the legend says he killed a terrible dragon who endangered the life of all the inhabitants. Visitors to Cracow can still see the dragon's cave by the Vistula, below the King's Castle. They can also see on the outskirts of the town two grave-mounds set up by the Poles of those far-off centuries in memory of Prince Krak and his daughter Vanda.

At the end of the tenth century Poland adopted Christianity. It happened during the reign of Mieszkoi, of the dynasty of Piast. The founder of that great dynasty

THE FIVE CONTINENTS & 100 NATIONS & RACES THAT INHABIT THEM

was said to be a wheelwright, and was chosen after the death of Prince Popiel to be leader of the nation, because "he was an honest man and a good worker."

His descendants reigned till the end of the fourteenth century. One of them, Boleslas the Great, became the first king of Poland in 1000. He had a wonderful mind, but unhappily his contemporaries could not grasp his ideas. He dreamed of a great union of all Slav nations, a union strong enough to hold in check the Germans who were never tired of trying to conquer the whole east of Europe. Unhappily, this dream never came true, and Poland had to suffer for it, being attacked over and over again.

WHEN POLAND STOOD LIKE A SENTINEL AT THE GATES OF EUROPE

But the Germans were not the only threat to Polish freedom in those days. In the thirteenth century hordes of Mongolian Tartars swept in from Asia, conquering Russia, and then attempted to break through Poland to the west of Europe. But they never succeeded. Poland stood at the gates of Europe like a faithful sentinel, barring the way of all barbaric hordes that might have been a menace to civilisation. She fought, she struggled, she suffered, in order that Europe might have peace.

There are still certain customs in Poland which come down from these Tartar invasions. One is the pageant of Konik (the pageant of the Little Horse), held in Cracow every year. It commemorates the brave deed of Micinski, a Polish hero who saved Cracow from the Tartars by galloping all night through the countryside, rousing the people against the advancing hordes. A peasant dressed in old national costume rides a hobby horse in the streets of Cracow, rousing the crowd with an imitation mace stuffed with straw. He is heralded by drums and whistles, and by the delighted shouts of children who love to get in his way.

THE STORY THE MUSIC FROM THE CHURCH TOWER TELLS

Another old custom is the Hejnal, an aria played by a trumpeter from the top of Our Lady's Church tower in Cracow. From six in the morning till midnight, at every hour, the Cracow trumpeter blows his little aria, facing in turn north, south, east, and west. His music dies away on a suspended note—a note no ear can forget having once listened to it. The aria tells

the story of how the Tartars came one day to destroy the royal city of the Poles; how the watchman in the tower of the Church of Our Lady saw them from his look-out and gave the signal to the people; how an arrow of the invader struck him in the throat and broke the unfinished note of his bugle call. Never since, through all the centuries, has the Hejnal been played to its final note.

The last Piast ruler who reigned in Poland was Casimir called the Great. It is said that he "found a Poland of wood and left a Poland of brick." He founded the first Polish university in Cracow in 1346, and many of the beautiful buildings in that town were built during his reign. He also allowed the Jews to settle in Poland, and from that time on, during all the persecutions of Jews in western Europe, the children of Israel have flocked into Poland from England, France, Italy, Spain, Germany, and Bohemia, finding security in the land of the Pole.

THE GENEROUS LAND THAT GAVE SANCTUARY TO THE REFORMERS

In all the long history of Poland nobody has ever been persecuted by the Pole for his religious belief. This religious tolerance brought to Poland at the time of the Reformation Protestant families who, escaping persecution at home, found in this country peace and shelter. Their descendants can still be found in Poland among families bearing such names as Morris, Darnley, Brown, Clark, and so on.

One of the most prominent figures in the Polish history of the fourteenth century, after Casimir, is Casimir's granddaughter, Jadwiga. She was elected Queen of Poland at fifteen. A beautiful and very clever girl, she was the protector of the poor and was patron of scholars. She married the Lithuanian prince Jagiello, so uniting the two countries and bringing Christianity to pagan Lithuania. This country had been invaded over and over again by the German Knights, who tried to convert it by fire and sword, but the people dreaded the sign of the Cross, and refused to be christened. After her wedding, Jadwiga went there as a missionary, and her smile soon conquered where the sword had failed. Yet this sweet girl-missionary could also, when needed, draw the sword and lead her army against Poland's enemies. She died very young, leaving all her precious jewels and treasures to the university of Cracow.

POLAND AND ITS PEOPLE

The rule of the Jagiellonic dynasty is marked as the golden age of Polish history and literature. Poland became a powerful country, her frontiers stretched from the Baltic to the Black Sea, her princes reigned in Hungary and Bohemia. The university of Cracow, the oldest in central Europe after Prague, became a centre of learning; so were the academies of Vilna, of Zamosc, and Lemberg (Lwow). Polish science in the fifteenth and sixteenth centuries was in no wise inferior to that of the west. This was the age of Nicholas Copernicus, the greatest Polish astronomer, and of Andrew Modrzewski, the great political writer. Prose and poetry kept pace with science. Kochanowski, the prince of Polish poets, wrote there his immortal *Treny*, a cycle of poems which describe his great sorrow after the loss of a beloved child. The prose of Rey and Gornicki, the eloquence of Peter Skarga, held an honourable rank. It may perhaps be said that the whole nation enjoyed in these times as much liberty as, perhaps more liberty than, any other in Europe.

PEOPLES OF MANY NATIONS WHO LIVE IN PEACE TOGETHER

Within the Polish Commonwealth, the Poles of different provinces lived side by side with the most various nationalities, such as Lithuanians, Ruthenians, Germans, Prussians, Courlanders, Jews, Tartars, Armenians, and no one tried to change the nationality of another. The Germans in the towns were governed by German law, the Jews by Jewish law, the Armenians by Armenian law, and so on.

Everybody who did something important for the Commonwealth became a noble, and had not only the right to vote but the right to be elected king. The nobility soon became so numerous that it grew to be ten per cent. of the whole population. The King of Poland, was, in fact, a President elected for life by the people. At first only princes of the same dynasty were elected, but after the death of Sigismund Augustus, the last of the Jagiellos, any foreigner or Pole of the simple rank of gentleman could become a candidate for the throne. The result was that many foreign princes competed for the Polish crown, and their reign was in most cases a complete failure. The last great Polish king was John Sobieski, a man of energy and devotion. His name became well known all over Europe as the Defender of Christianity.

It was in 1683 that the Turkish invasion reached as far as Vienna. The Austrian Emperor Leopold had no more strength to defend the capital. He sent messengers to the Polish king asking for help, and Sobieski came to Vienna with his faithful army. The mere sound of his name filled the Turks with terror. They had met him in battle, and they knew the power of his sword. The morning before the great battle Sobieski went to a little chapel on Kahlenberg, a hill near Vienna, to hear Mass, and after having received the Holy Communion he went to the battlefield. The Turks were defeated, but Sobieski never boasted of the victory that saved Europe. He sent home a message in the words of Julius Caesar (*veni, vidi, vici*) with a slight alteration. He wrote: *I came, I saw, God conquered.*

THE DARK DAYS FOR POLAND WHEN JOHN SOBIESKI DIED

After Sobieski's death two German princes reigned in succession. They brought corruption into the country and plunged it into a complete chaos. One of them started a conspiracy against Poland, and a civil war broke out which weakened the country and made it a prey to its greedy neighbours. In 1772 Russia, Germany, and Austria marched their armies into Poland, and occupied several provinces, reducing her area from 304,000 square miles to 216,000 square miles. The country was almost defenceless, with practically no army and no funds. It set itself to work. An Education Committee was organised as long ago as 1773, which must have been one of the first Boards of Education in Europe, if not actually the first. It covered the land with secondary and primary schools accessible to all, while a society furnished them with excellent school books.

THE SPLENDID REFORMS THAT CAME JUST TOO LATE

Before many years had passed the country opened a splendid network of roads and developed its industries, in spite of the difficulties created by Prussia. In 1791 a constitution was passed which brought many radical reforms. It granted liberty to every Pole as a free citizen, and free education to every Polish child. Unhappily it was all too late. Russia, Germany, and Prussia renewed their violence. A second partition took place in 1793, and a desperate struggle began.

The whole nation, led by Thaddeus Kosciusko, rose against its oppressors.

Peasants as well as nobles joined the ranks of the voluntary army. Not a single Power came to help Poland in this last campaign. In spite of all the courage and heroism shown by the Poles in this struggle they were defeated. Kosciusko himself was grievously wounded and taken prisoner. The Russians stormed Praga, the suburb of Warsaw. Thousands of men, women, and children were massacred. Warsaw was forced to capitulate. Now (in 1795) the final partition took place, and Poland was wiped out from the map of Europe. She had ceased to exist as an independent State.

But she went on living in the heart of every Pole. To the Poles every home was Poland, every child was Poland. They had to suffer unspeakable agonies for being Poles. Only Austria, who had the smaller part, granted them a certain amount of freedom. Russia and Germany persecuted everything that was national. Poles were not allowed to speak their own language in public, to sing national songs, to read their own literature. There are cases of Polish children being beaten to death for refusing to say their prayers in German. Every sort of treason against Poland was encouraged by her enemies, and no Pole was admitted to a Government office unless he consented to become the enemy of his country.

THE TERRIBLE DAYS OF POLAND UNDER THE RUSSIAN TSARS

Life in Poland was very sad at that time, and people in the west of Europe cannot have dreamed of the terrible suffering that was going on so near. Russia had a special spy-system for her Poles, and none was ever safe from spies, even in his own home. People were stopped in streets by the police, their pockets were turned out, and if anything suspicious was found they were sent to prison. Even in the night the police would go into Polish homes. People were turned out of bed, the house was searched, and often the father or the son would be taken away, never to be seen again. People were taken to prison for no reason at all, and kept there for months, for there was no appeal.

Thousands of Poles were suffering hunger and cold in the damp, dark Russian prisons, thousands were sent to Siberia to the hard work of the mines, their only crime being that they were Poles. They loved Poland more than

wealth, more than happiness, more than life itself. The main high-road to Siberia is called by Poles the Polish Golgotha. Along this road every year hundreds of Poles were driven, side by side with the worst Russian criminals. The convicts had to walk all the way, in storm or frost or snow, and if one lingered behind he was beaten with long leather whips with sharp lead ends by mounted Cossacks driving men like a herd of sheep. Sometimes a man dropped in the middle of the road, and even leaden whips could not force him to get up; he died where he fell, and no one troubled to remove his body. It was left to the wolves.

THE YEARS OF MISERY AND SLAVERY IN THE SIBERIAN MINES

In Siberia most of the convicts were taken down into the mines, where they were chained to the wheelbarrows so that they could not escape. They were kept there for ten, twenty, thirty years, or for life. If they were released sooner it was probably because they were mad, and their keepers wanted to get rid of them. Sometimes Poles were sent to Siberia as settlers. They were given a certain area where they could live, but were never allowed to go back to their homes in Poland. Many of those settlers did wonderful work among the native tribes, teaching them all useful crafts. They were their doctors, their teachers, their prophets.

One Pole spent 25 years as a convict on the island of Sakhalin. All that time he was helping the natives in every way, teaching them to use their hands and their brains, healing their sick, telling them wonderful things about the world and about God, until the natives began to worship him. They would bring offerings to him, burning incense round his house, and when he had to leave the island they mourned and wept like children.

THE DESPERATE ATTEMPTS OF THE POLES TO THROW OFF THEIR CHAINS

The Poles tried many times to free themselves from their oppressors. There was an insurrection in 1831, and others in 1846 and 1863, but they failed, in spite of the tremendous sacrifice the people made. Every insurrection was followed by more and more suffering, yet the soul of the nation remained unbroken. Polish literature and Polish art blossomed in spite of all. The very bitterness of life gave to Polish art a touch of something

sublime. It was during the insurrection of 1831 that Chopin, Poland's greatest composer, wrote his immortal Etude and Prelude. When Nicholas heard them played he exclaimed: "This music is dangerous! It is like guns hidden under beautiful roses."

**THE ARTISTS WHO WERE STIRRED WITH
A GREAT LOVE OF THEIR COUNTRY**

Chopin's contemporaries were Adam Mickiewicz, Julius Slowacki, and Sigmund Krasinski, the three greatest poets of Poland. They were followed by the painters, Arthur Grottger and Jan Matejko. In the works of all these artists the love of Poland finds its deepest expression. Every line of their poetry, every picture, is filled with it. No wonder the reading of such literature was prohibited, yet it was read because it gave the people new vision. Poland in the eyes of its poets was the Christ of the nations. She had to suffer as Christ suffered, she had to be despised and forgotten, she had to be tortured and crucified and buried to rise one day in splendour and glory even as Christ had risen. They saw in her suffering the purifying fire that will help her to grow nobler and better.

"The world lays its hopes on the nations that have faith," says Mickiewicz, and indeed he saw that faith in the Polish nation. That is why he says to the Poles in his "Polish Pilgrim":

Verily I say unto you—ye must not learn civilisation from alien nations, but must teach them the true Christian civilisation.

Each one of you hath within his soul the seed of the nation's future laws and the measure of her boundaries. As much as ye make your own souls greater and better, so much will ye better your laws and enlarge your boundaries.

**THE TEMPTING BAIT THAT THE
POLES WOULD NOT TAKE**

The dream of the poets came true sooner than anybody expected. Poland has regained its independence, but before that happened it had to pass one more trial, harder, perhaps, than any before. At the beginning of the Great War Poland's enemies (Germany, Austria, and Russia) were lavish in promises if the Poles would give them their support. They all promised to Poland freedom and independence. But the Poles did not trust them. Nevertheless, they were forced to fight in enemy armies side by side with Germans and

Austrians, as well as Russians. Poles had to fight against Poles, brothers against brothers. Over and over again whole regiments refused to fight. They threw down their arms, and were shot on the spot by the German, Russian, or Austrian regiments behind them. Many Polish soldiers escaped to France, Italy, or Serbia, to join the armies of the Allies. There was a Polish Legion in France fighting under French leadership. Meanwhile, all through the war, the German, Austrian, and Russian armies were fighting on Polish soil, burning Polish towns and villages, destroying Polish homes. In 1918, after four years of war, the country was like a heap of ruins. Thousands of people had to live a wandering life. Their homes were burned, their fields were a mass of shells, they had nowhere to live and scarcely anything to eat; yet they clung to their bit of soil, refusing to be driven into Russia or Austria. There were areas where people lived in caves dug in the ground. Terrible epidemics were spreading all over the country, and the mortality was appalling.

**HOW POLAND SHIELDED EUROPE FROM
THE BARBARISM OF THE EAST**

But the resurrection was at hand. The Treaty of Versailles made Poland a free and independent State in 1919. The three parts were joined again into one, though the new Poland was only about half the size of the Poland of 1772. But no sooner had the country regained its freedom than the Bolshevik army invaded it, burning the harvest in the fields and destroying everything that remained still undestroyed. This happened in the summer of 1920. Once again was Poland called upon to shield the rest of Europe from the eastern barbarism, and it succeeded. The Polish army was weak; there were not enough men to fill its ranks, but the women, the old people, and the children rallied. There was a regular women's battalion fighting at the front, and many women and girls fought disguised as men. Whoever could carry arms hurried to defend the country. The pluck and courage of many Polish boys and girls (mostly Boy Scouts and Girl Guides) were beyond all words.

The Bolsheviks were defeated, and Poland could settle down at last to do peaceful and constructive work. Her new constitution is republican, with a President and a Parliament, called the Sejm, with two Chambers, one elected by all men and women over 21, and a Senate elected by

COUNTRIES

all men and women over 30. There are several women deputies. But to do her peaceful work Poland was forced to keep up a large army, which burdened her and kept her poor. It is only necessary to look at the map of Europe to see why this is so.

THE REVIVAL AMONG THE POLES OF THE SPIRIT OF OTHER DAYS

The new and inexperienced Government had at first a difficult task to face. The country was in ruins; ravaged by epidemics and starvation, the people were all tired of war; there were no funds in the treasury, and the leaders of the nation had been allowed no experience in the art of ruling a nation. Yet it is surprising how much was accomplished. The people pulled themselves together to work. The shattered towns and villages have been rebuilt, schools and factories are springing up all over the country; even art is reviving. Painters such as Chelmonski, Ruszczyc, Tetmajer, and Mchoffer (who designed the beautiful stained glass windows in Fribourg Cathedral, Switzerland); poets like Staff, Tetmajer and Kasprowicz (the brilliant translator of many English poets); novelists like Sienkiewicz, Reymont, Zeromski, Weyssenhoff; musicians and composers like Paderewski (the first Polish premier), Karłowicz, Niewiadomski, Rozycki, and many others, show that the sense of beauty and the art of expressing it are still fully alive in Poland. Given time and capital, there is no limit to the development of this country. Her soil, especially in the eastern parts, is the richest in Europe. It has no equal except in Russia. Agriculture has a very high standard, and much of Polish corn is being exported to foreign countries. It is lovely to see the Polish plain in summer; vast stretches of land covered with cornfields. There are no hedges or ditches; all the fields run into each other so that they form one great mass of gold. In a breeze the fields look like a sea of golden waves with a spray of golden pollen above it.

THE FORESTS WHICH SURROUND THE FIELDS OF WAVING CORN

The fields are bordered with forests; pine and birch trees on light soil, with oak, beech, elm, and elder trees on heavy soil. Especially in the east and north one seems to be surrounded by them; they shut in every horizon. And how beautiful they are, with all their wild life, teeming with elk and bison, bears, stags, boars,

deer, and hares roaming about freely. The war has done great damage to the wild life of Poland, but there is hope that under protection it will soon be restored.

Poland is the third forest country in Europe. It has over sixteen million acres of timber land, which supply many European countries. But there are more riches in Poland than corn and timber. Her oil-fields are among the richest in the world, though 300 of the greatest wells were set on fire by the Russians before their retreat from Poland. Then there are salt mines in Wieliczka, near Cracow, which turn out 140 million tons of salt a year. There are big coal mines in the Black Country of Silesia, and zinc mines and potash fields in Malopolska. One of the chief Polish industries is the growing of sugar-beet and the manufacture of sugar. War ruined most of the beet-fields, and wrecked the sugar factories, yet four years of peace were enough to revive 62 of the largest sugar factories, which are once more producing, in spite of the great lack of machinery and fertilizers.

THE NEW LIFE COMING TO THE INDUSTRIES OF POLAND

Lodz and Zyrardow, near Warsaw, are the great textile centres. Their factories turn out woollen and cotton goods which can compete with any other country's. Silesian ironworks and foundries, Lemberg potteries and glassworks, the field machinery and engine factories of Poznan and Warsaw, are the pride of the new Poland. Yet, with all the revival of her industries, Poland is and will remain an agricultural country. Poles are great lovers of the great Out-of-doors, and work on the soil is always regarded as the noblest. The peasant clings to his land, however small it may be, for to him every bit of Polish soil is sacred.

Many of the poorest Polish emigrants who go out to North or South America to work take with them a handful of Polish soil. They keep it like a precious treasure, and if an emigrant dies in a foreign land this bit of Polish soil is placed on his heart and he is buried with it.

This love of the soil finds also its expression in a strange custom of erecting high earth mounds in memory of historical people or events. We see such mounds near Cracow, and near Lemberg, the Lemberg mound erected in memory of the union of Poland and Lithuania. A mound erected in memory of the Polish victory

POLAND AND ITS PEOPLE

over the German Knights of the Cross, five centuries ago, was started near Niepotomice only in the year 1910. Thousands of people came from all over Poland, bringing with them little sacks full of earth from their fields or gardens. Two American Poles came across the Atlantic and brought a sackful of the American soil on which they were labouring. Everybody emptied his sack on the spot, and a tiny hill sprang up like those made by children on the seashore. It grew and grew, people treading it down and turning more earth on to it, until it got so big that they had to climb up to throw the earth on the top. When all the sacks were emptied people filled wheelbarrows with the earth of the fields around, and went on building the hill, until at last it got so big that it took a long time to climb and could be seen from far away. Soon grass and flowers covered it, and people made a little winding path up to the top, where travellers may rest and enjoy a lovely view.

Looking to the south one can see from afar a long range of mountains, the Carpathians.

They are the glory of the Polish landscape. Their western part, the Tatras, are wild and rocky. They are not rich in minerals, but they have more than that. They have the unspoiled beauty of a wild God-made country. In summer their valleys are covered with exquisite alpine flowers. Herds of cattle and sheep graze on their slopes, and the air is filled with the sounds of rushing torrents, tinkling bells, and shepherds' songs. Golden eagles build their nests in the granite cliffs, swift chamois and marmots live there side by side with bears. It is indeed an enchanted bit of land, and tourists come there from

all over Poland and from foreign countries to taste the joys of wild life and the thrills of climbing. In winter the landscape changes. Snow covers the ground four or five feet deep. The junipers and dwarf pines disappear under the snow, and the brooks and streams make their way under white glittering arches. Then is the time for winter sports, ski-ing, bobsleighing, tobogganing. The small highland town of Zakopane is crowded in winter with sportsmen. All Poland meets here. Happily the war has not changed the Polish landscape. The mountains and the plains look the same. But the changes are marked on

villages and towns. The old-fashioned country houses, seeming to guard and protect the little villages around, have practically disappeared. They were Poland's treasure houses. They contained priceless collections of pictures, books, tapestries, and arms. No money can restore them. They are lost for ever, another sacrifice to the monstrous god of war.

Cracow, the old Polish capital, has not been touched by war, though the Russian army was very close to its

walls. All its beautiful old buildings were saved. There is the lovely old King's Castle, the beautiful cathedral where most of the Polish kings lie buried, the Cloth Hall, the old university, the quaint old city gates, the many old churches and houses that saw the rise and fall of Poland, its darkest and its greatest days. It is a most picturesque place, full of gay colours. Some of the old buildings are of red brick, with bright green copper roofs. On a market day the main streets and the big market square are full of peasant women dressed in their picturesque national costumes. If the day is fine the town looks one blaze of



THE FINE STATUE OF JOHN SOBIESKI IN WARSAW

colour. The market place is the centre of the town. Here, in the days of old, the kings of Poland received the homage of the people. The place is surrounded by old palaces and houses, with wide arched entrances and beautiful courtyards beyond.

Among other Polish towns is Poznan, the capital of what was German Poland. Its quaint old town hall, with its slender tower rising 200 feet and dominating the city, is a striking contrast to the heavy massiveness of such later buildings as the German Kaiser's palace, a big humpy castle, used by the Germans for their Colonisation Office. Here in this castle the Colonisation Commission worked for many years. Its real task was to drive out Poles from Poznan by buying up their land for German colonists. The Commission had a capital of a hundred million marks, received from the Government for its work. The castle now houses a Polish university.

WARSAW AS THE CENTRE OF TRADE BETWEEN EAST AND WEST

Then there are Lemberg, the town that suffered most during the war; pretty Vilna in the north, and Warsaw, the capital, standing right in the middle of Poland, on the banks of the River Vistula. Since the Middle Ages this city has been a centre of trade between the East and West. Its great navigable river connects it with the sea, and it was for centuries used as the chief route for Polish exports. Unhappily all the old bridges over the river were destroyed during the war, and only temporary bridges have been built since; but in spite of that the view of the river is very attractive. In summer steamers and big cargo boats can be seen there going down to Danzig, or small boats coming up from Pulawy and Sandomierz bringing loads of fine ripe fruit for the market. The city rises on slopes along the west bank of the Vistula, about 150 feet above the water level.

THE SPLENDID HOUSES OF THE MERCHANT PRINCES OF OLD

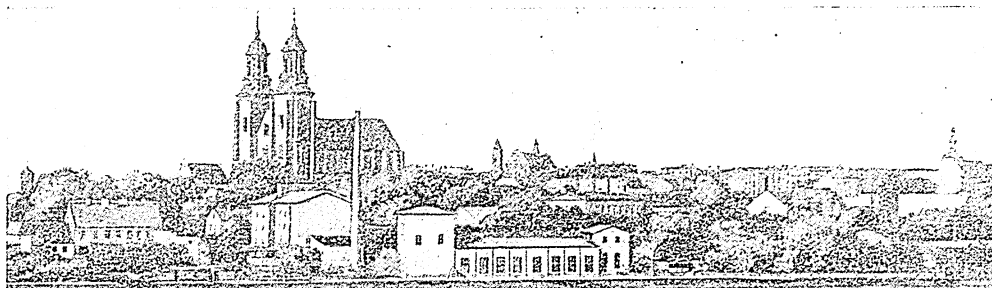
The towering red roofs of the old houses, with clusters of green trees between, make a very beautiful picture. The Old Town is the most fascinating part of the city. Most of its houses were the homes of rich burghers and merchant princes centuries ago. They have their special names and their coats-of-arms. There is the House of the Ships, the House of the Lions, the House of the Negro, and so on. The floors of many of them show very fine

antique work in wrought iron, bronze, and wood. Some of the old streets are extremely narrow. They hold under their pavements many a secret passage which made a good hiding-place in the times of Russian persecution. Close to the Old Town stand an ancient castle and the fine Gothic cathedral of St. John, built in the fourteenth century. One of the gems of Warsaw is her famous park.

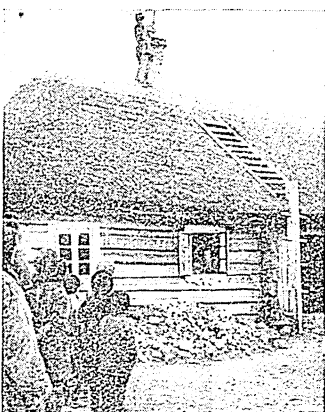
In the middle stands the old Royal Summer Theatre, an open amphitheatre with a stage built of marble in the fashion of a ruined temple. The stage itself is on an island, and a narrow stream of water enclosed in marble embankments separates it from the amphitheatre. The Polish State Theatre in Warsaw is the centre of a whole theatre system, comprising six theatres, a dramatic school, a school of the ballet, two orchestras, and two choruses. The love of art is very strong in the Poles. They are great lovers of beauty. In temperament they are highly strung, sensitive, and very quick in grasping new ideas; but the quality they often lack is perseverance in material undertakings. Their business ability has never been strong, though the nation is making a determined effort to acquire it.

THE END OF POLAND'S AGE-LONG STRUGGLE FOR FREEDOM

The whole country is now hard at work. The number of unemployed has been reduced from two millions in 1919 to a few thousand. In many business offices one can see over the desks the inscription: "Transact your business and go. Time is money." The Pole of today has no time to waste. He knows that every wasted hour means loss to the new reviving Poland, and, after all, Poland is the biggest thing in his life. People say that the more we suffer for a cause the more we love it, and surely no nation has suffered more than the Poles for the love of their homeland. They are a nation of strugglers. All through the past ages of history they were struggling, shielding Europe from barbarism. At last they became the prey of their despotic neighbours, yet still they struggled against their oppressors, never ceasing, never yielding to weakness, till justice was done to them. And now they are struggling again, this time, let us hope, to bring to their war-stricken country a final peace and great prosperity.



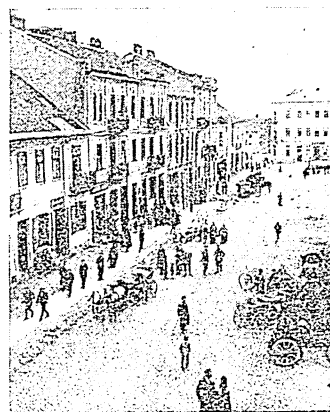
THE OLD TOWN OF GNESEN WITH ITS FINE CATHEDRAL



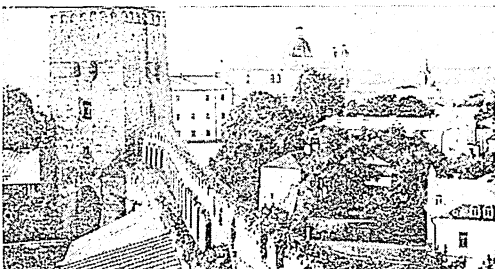
THE VILLAGE CHIMNEY SWEEP
AT WORK



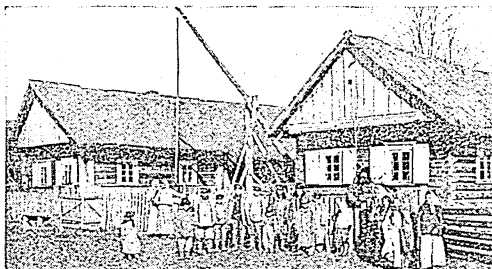
THE JEWISH QUARTER
IN VILNA



THE MAIN STREET
IN LOMZA



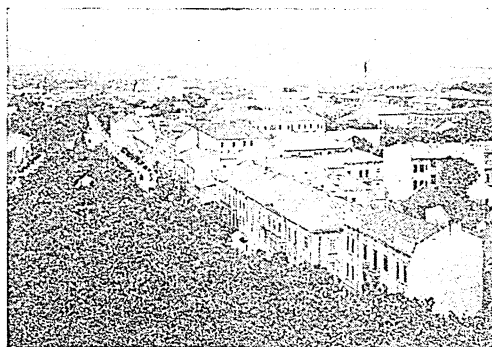
LUTSK, IN VOLHYNIA



A VILLAGE IN EASTERN POLAND



A STREET IN STRYJ



TARNOPOL, IN GALICIA

POLAND, LITHUANIA, LATVIA, & ESTHONIA



THIS MAP SHOWS FOUR OF THE NEW COUNTRIES CARVED OUT OF RUSSIA AFTER THE GREAT WAR

This map illustrates the distribution of various products and animals across Central Europe. The countries shown include Sweden, Estonia, Latvia, Lithuania, Prussia, Poland, Czechoslovakia, Hungary, and Rumania. Major cities like Stockholm, Riga, Vilna, and Warsaw are marked. The map is divided into regions by dashed lines, and the distribution of products is indicated by different symbols and patterns. Various products such as wheat, timber, sugar, and leather are marked, along with animals like the stag beetle, hare, and beaver.

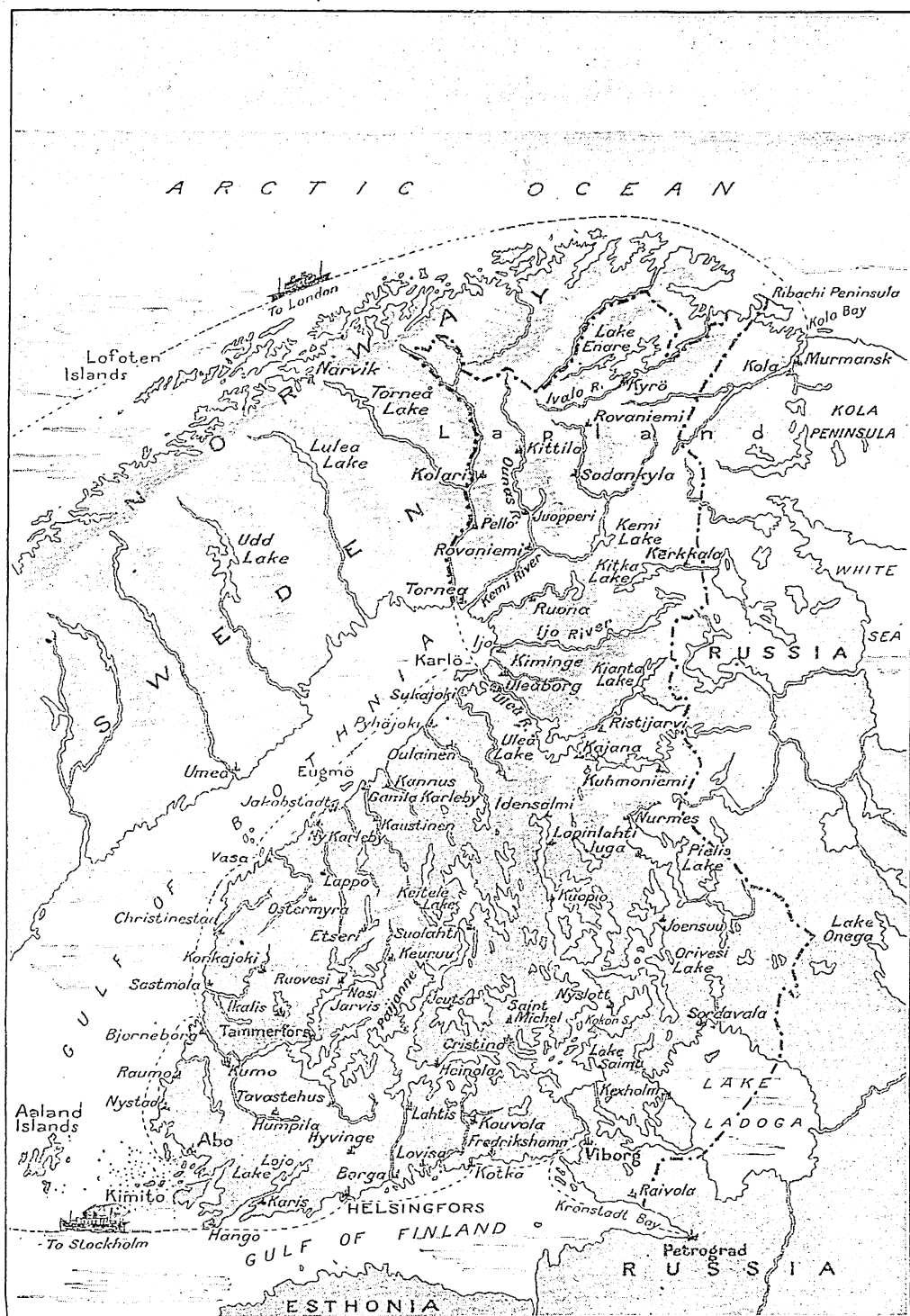
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FINLAND'S ANIMALS, PLANTS, & INDUSTRIES

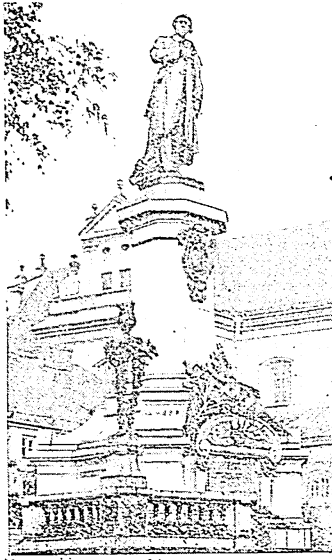


FINLAND HAS A VARIED ANIMAL AND PLANT LIFE, AND HER INDUSTRIES ARE GROWING

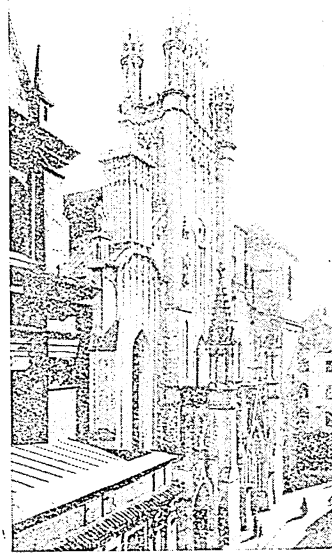
FINLAND, THE LAND OF LAKES & TORRENTS



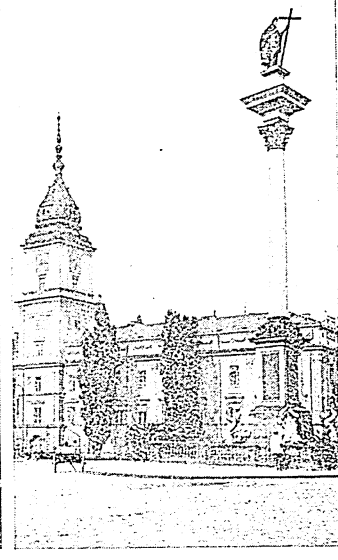
A BIRD'S-EYE VIEW OF FINLAND SHOWING ITS LAKES, RIVERS, CITIES, AND SHIPPING ROUTES



THE STATUE OF ADAM
MICKIEWICZ IN WARSAW



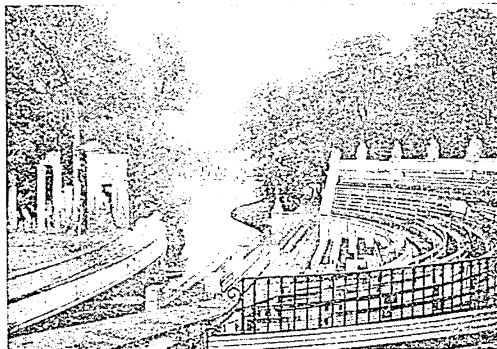
ST. JOHN'S CATHEDRAL
WARSAW



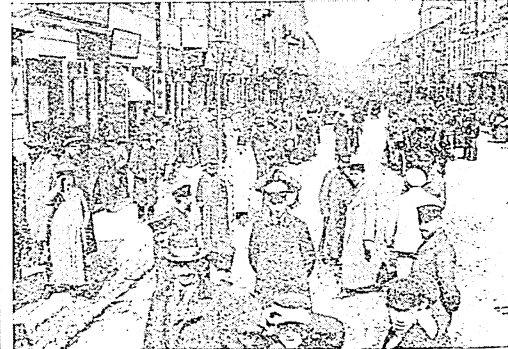
THE PALACE OF SIGISMUND III
IN WARSAW



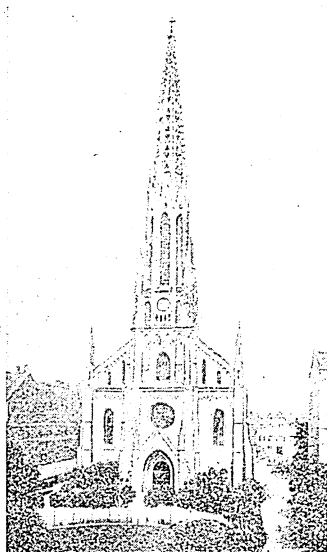
THE BRIDGE ACROSS THE VISTULA AT WARSAW WHICH LEADS TO PRAGA



THE SUMMER THEATRE IN A WARSAW PARK



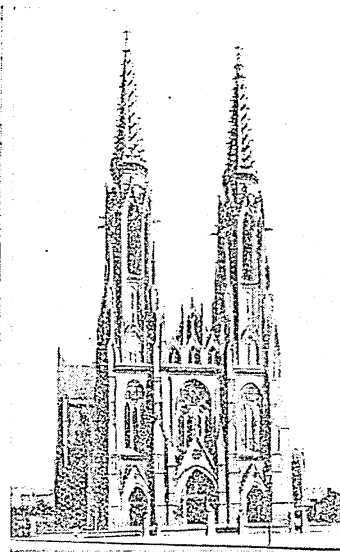
A CROWDED STREET IN WARSAW



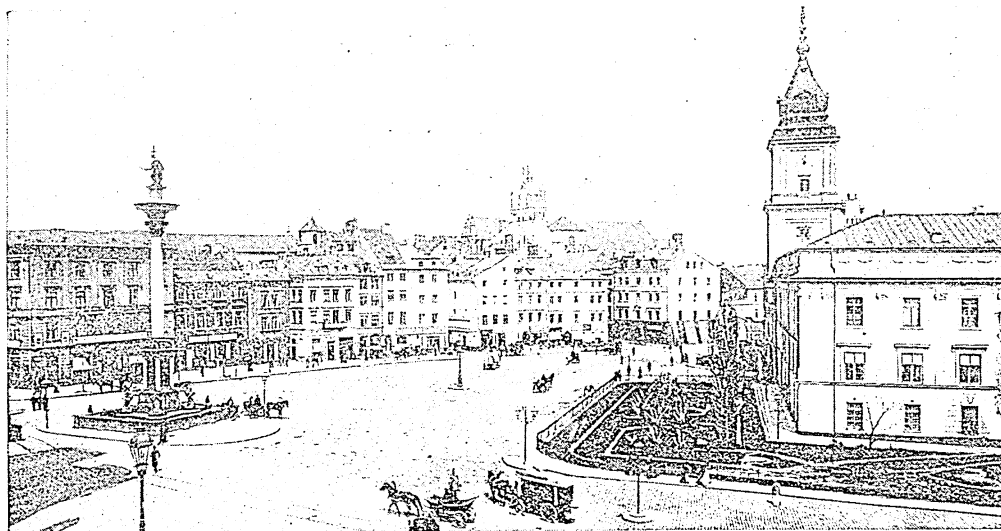
THE CALVINIST CHURCH
IN WARSAW



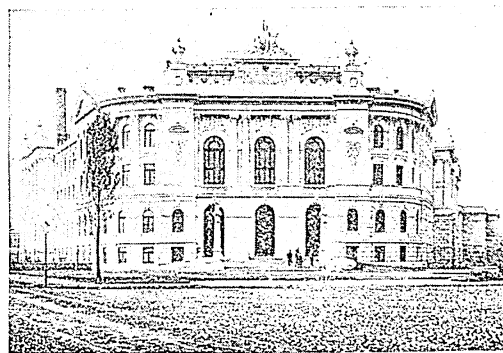
THE JEWISH VEGETABLE
MARKET IN WARSAW



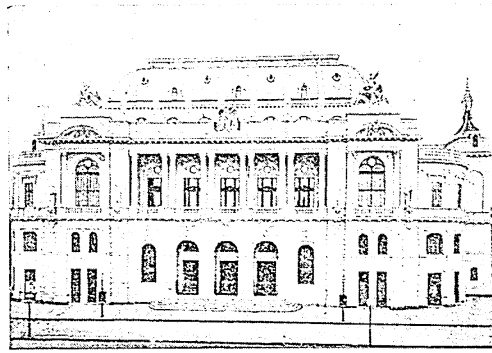
THE CHURCH OF ST. FLORIAN,
WARSAW



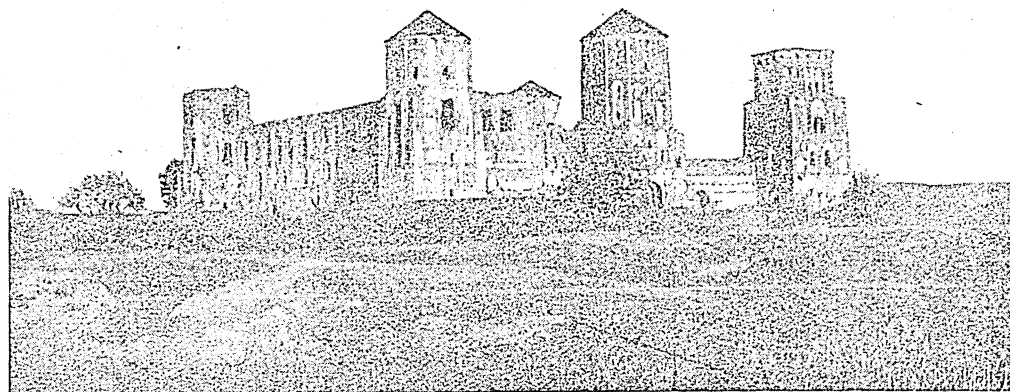
ZAMKOWY SQUARE IN THE CENTRE OF WARSAW



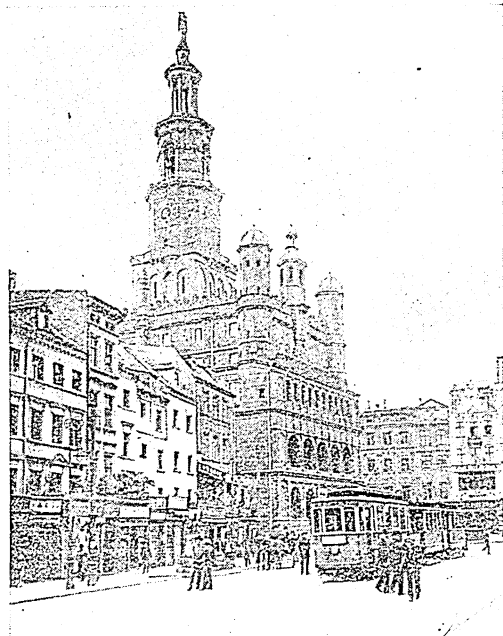
THE POLYTECHNIC INSTITUTE
IN WARSAW



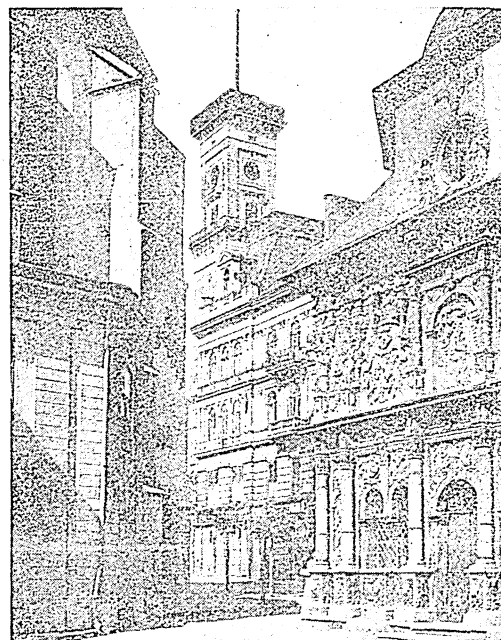
THE PHILHARMONIC HALL
IN WARSAW



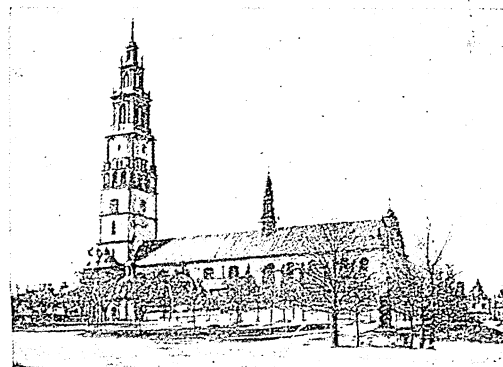
THE GRIM-LOOKING CASTLE OF MIR NEAR VILNA



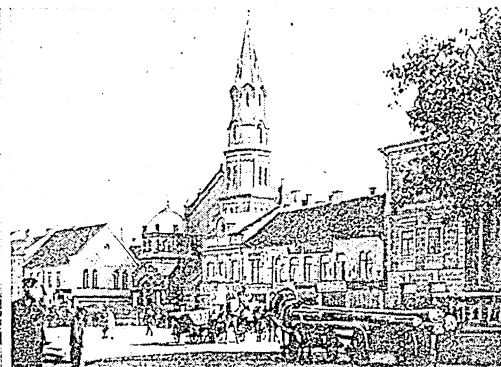
THE TOWN HALL OF POZNAN



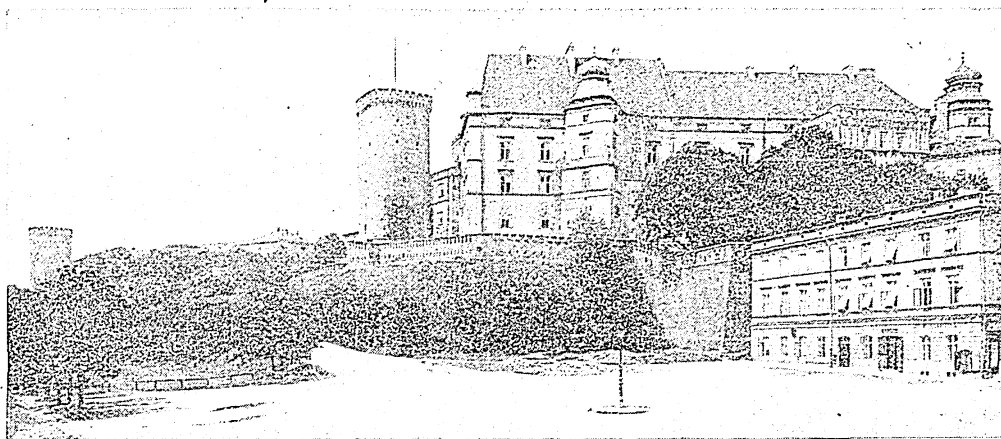
THE CATHEDRAL AT LEMBERG



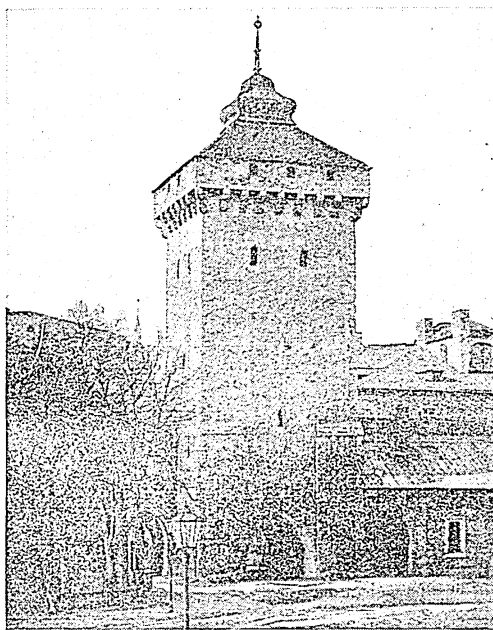
THE CATHEDRAL AT CZENSTOCHOWA



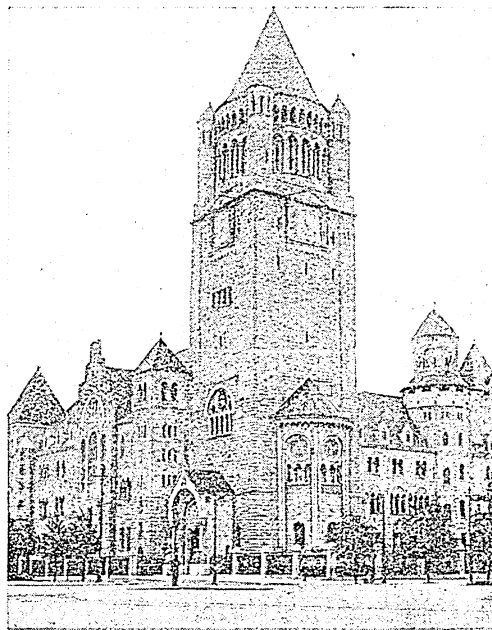
A CHURCH IN VILNA



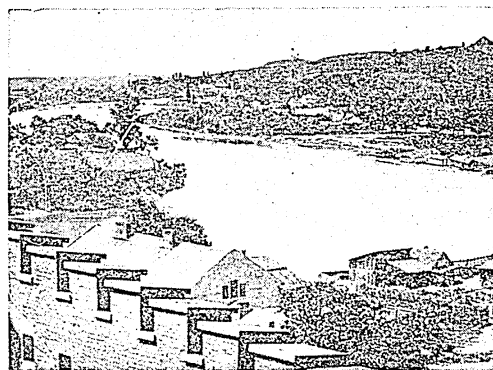
THE OLD ROYAL CASTLE AND PALACE AT CRACOW



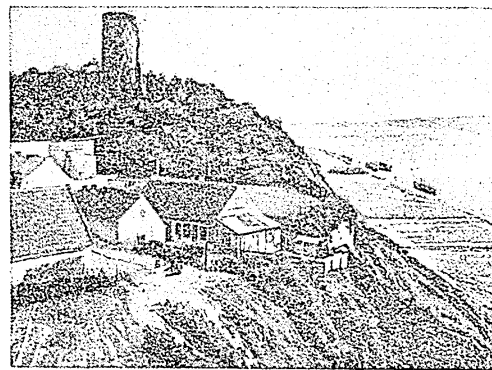
THE TOWER OF ST. FLORIAN, CRACOW



THE CASTLE AT POZNAN



SUBURBS OF CRACOW



THE CASTLE HILL. GRAUDENZ



A PEASANT OF EAST POLAND



A GIRL OF VILNA



A HAPPY OLD PEASANT



THREE LITTLE FRIENDS OF VILNA



JEWISH BOYS AT SCHOOL IN WARSAW



PEASANTS OUTSIDE THEIR HOME

The pictures on these pages are by Messrs. Jan Bulhak, Donald McLeish, E N.A., and others

One Thousand Poems of All Times and All Countries



GRAY'S ELEGY

Thomas Gray, the author of this beautiful elegy, was a great scholar, but he did not write many poems. The churchyard about which he wrote is that of Stoke Poges, in Buckinghamshire, of which a picture as it was in the time of the poet

THE curfew tolls the knell of parting day,
The lowing herd wind slowly o'er the lea,
The ploughman homeward plods his weary way,
And leaves the world to darkness and to me.

NOW fades the glimmering landscape on the sight,
And all the air a solemn stillness holds,
Save where the beetle wheels his droning flight,
And drowsy tinklings lull the distant folds:

SAVE that from yonder ivy-mantled tower
The moping owl does to the moon complain
Of such as, wandering near her secret bower,
Molest her ancient solitary reign.

BENEATH those rugged elms, that yew tree's shade,
Where heaves the turf in many a mouldering heap,
Each in his narrow cell for ever laid,
The rude forefathers of the hamlet sleep.

THE breezy call of incense-breathing morn,
The swallow twittering from the straw-built shed,
The cock's shrill clarion, or the echoing horn,
No more shall rouse them from their lowly bed.

is given above. Gray died in 1771, and was buried in this churchyard. The Elegy Written in a Country Churchyard is one of the most perfect poems in the English language, and it is, perhaps, more frequently quoted than any other.

For them no more the blazing hearth shall burn,
Or busy housewife ply her evening care:
No children run to lisp their sire's return,
Or climb his knees the envied kiss to share.

OFt did the harvest to their sickle yield,
Their furrow oft the stubborn glebe has broke;
How jocund did they drive their team afield!
How bowed the woods beneath their sturdy stroke!

LET not Ambition mock their useful toil,
Their homely joys, and destiny obscure;
Nor Grandeur hear with a disdainful smile
The short and simple annals of the poor.

THE boast of heraldry, the pomp of power,
And all that beauty, all that wealth, e'er gave,
Await alike th' inevitable hour:
The paths of glory lead but to the grave.

NOR you, ye Proud, impute to these the fault,
If Memory o'er their tomb no trophies raise
Where through the long-drawn aisle and fretted vault
The pealing anthem swells the note of praise.

CAN storied urn or animated bust
Back to its mansion call the fleeting breath?

POEMS · SONGS · BALLADS · VERSES AND RHYMES WITH MUSIC

POETRY

Can Honour's voice provoke the silent
dust,
Or Flattery soothe the dull cold ear of
Death?

Perhaps in this neglected spot is laid
Some heart once pregnant with celestial
fire;
Hands that the rod of empire might have
swayed,
Or waked to ecstasy the living lyre.

But Knowledge to their eyes her ample
page,
Rich with the spoils of time, did ne'er
unroll;
Chill Penury repressed their noble rage,
And froze the genial current of the soul.

Full many a gem of purest ray serene
The dark, unfathomed caves of ocean
bear:
Full many a flower is born to blush unseen,
And waste its sweetness on the desert
air.

Some village Hampden, that with daunt-
less breast
The little tyrant of his fields withstood,
Some mute inglorious Milton here may
rest,
Some Cromwell guiltless of his country's
blood.

Th' applause of listening senates to com-
mand,
The threats of pain and ruin to despise,
To scatter plenty o'er a smiling land,
And read their history in a nation's eyes,
Their lot forbade: nor circumscribed
alone
Their growing virtues, but their crimes
confined;
Forbade to wade through slaughter to a
throne,
And shut the gates of mercy on man-
kind:

The struggling pangs of conscious truth to
hide,
To quench the blushes of ingenuous
shame,
Or heap the shrine of Luxury and Pride
With incense kindled at the Muse's flame.
Far from the madding crowd's ignoble
strife
Their sober wishes never learned to
stray;
Along the cool, sequestered vale of life
They kept the noiseless tenour of their
way.

Yet e'en these bones from insult to protect
Some frail memorial still erected nigh,
With uncouth rhymes and shapeless
sculpture decked,
Implores the passing tribute of a sigh.

Their name, their years, spelt by th' un-
lettered Muse,
The place of fame and elegy supply:
And many a holy text around she strews,
That teach the rustic moralist to die.

For who, to dumb forgetfulness a prey,
This pleasing, anxious being e'er re-
signed,
Left the warm precincts of the cheerful
day,
Nor cast one longing, lingering look
behind?

On some fond breast the parting soul
relies,
Some pious drops the closing eye re-
quires;
E'en from the tomb the voice of Nature
cries,
E'en in our ashes live their wonted fires.

For thee, who, mindful of th' unhonoured
dead,
Dost in these lines their artless tale
relate;
If chance, by lonely Contemplation led,
Some kindred spirit shall inquire thy
fate;

Haply some hoary-headed swain may say,
" Oft have we seen him at the peep of
dawn
Brushing with hasty steps the dews away,
To meet the sun upon the upland lawn.
" There at the foot of yonder nodding
beech,
That wreathes its old fantastic roots so
high,
His listless length at noontide would he
stretch,
And pore upon the brook that babbles
by.

" Hard by yon wood, now smiling as in
scorn,
Muttering his wayward fancies he would
rove;
Now drooping, woeful-wan, like one
forlorn,
Or crazed with care, or crossed in hope-
less love.

" One morn I missed him on the 'customed
hill,
Along the heath, and near his favourite
tree;

POETRY

Another came ; nor yet beside the rill,
Nor up the lawn, nor at the wood was
he ;

"The next, with dirges due in sad array,
Slow through the church-way path we
saw him borne ;
Approach and read (for thou canst read)
the lay
Graved on the stone beneath yon aged
thorn."

*Here rests his head upon the lap of Earth
A Youth to Fortune and to Fame un-
known ;
Fair Science frowned not on his humble
birth,
And Melancholy marked him for her own
Large was his bounty, and his soul sincere ;
Heaven did a recompense as largely send
He gave to Misery all he had—a tear,
He gained from Heaven ('twas all he
wished) a friend.*

*No farther seek his merits to disclose,
Or draw his frailties from their dread
abode
(There they alike in trembling hope repose),
The bosom of his Father and his God.*

IN THE MAKING

Mr. A. St. John Adcock, a notable critic of modern writings, is himself a poet in spirit and in form. Here he expresses the thought, eternally true, that each of us is for ever changing his personality, with death and re-birth as vital processes continually taking place during his life.

THE end is never afar
From the hour when our life begins ;
In peace we are still at war,
For the victories no one wins ;
The young speed on to the fray,
The old go forward in fear,
Yet youth may die in a day,
And age may live for a year.

Shaped and broken and wrought
Anew in the world's rough strife,
I change in heart and in thought,
And grope from life into life ;
No longer now we abide
In the world that was ours of yore,
And I have so often died,
I dread not death any more.

The boy that I used to be
Is naught but an old regret—
A something that sleeps, ay, me !
In a grave that others forget :
I have changed as the years have sped,
I shall change as the years go by—
I that was I am dead,
And I that am I must die.

I SING OF BROOKS

Hesperides is the title of one of Robert Herrick's books of verse, and this poem is a preface giving the subjects the poet is writing about. They are all country subjects, for Herrick lived in Devonshire ; but, though he wrote much and daintily about the country, he dearly loved the town.

I SING of brooks, of blossoms, birds, and
bowers,
Of April, May, of June, and July flowers ;
I sing of Maypoles, hock-carts, wassails,
wakes,
Of bridegrooms, brides, and of their bridal-
cakes.

I write of youth, of love, and have access
By these to sing of cleanly wantonness.
I sing of dews, of rains, and, piece by piece,
Of balm, of oil, of spice, and ambergris.

I sing of times trans-shifting ; and I write
How roses first came red and lilies white.
I write of groves, of twilights, and I sing
The court of Mab and of the Fairy King.

I write of Hell ; I sing, and ever shall,
Of Heaven—and hope to have it after all.

ANGELS HOLY, HIGH AND LOWLY

The beautiful Biblical thought that all Creation hymns the praise of its Creator is put in this sacred song with freshness of expression and musical rhythm by Professor Stuart Blackie. The professor, who lived from 1809 to 1895, was a notable and picturesque figure in the Scotland of his day.

ANGELS holy,
High and lowly,
Sing the praises of the Lord !
Earth and sky, all living Nature,
Man, the stamp of thy Creator,
Praise ye, praise ye, God the Lord !

Sun and Moon bright,
Night and moonlight,
Starry temples azure-floored ;
Cloud and rain, and wild winds' madness,
Sons of God that shout for gladness,
Praise ye, praise ye, God the Lord !

Ocean hoary,
Tell His glory,
Cliffs, where tumbling seas have roared !
Pulse of waters, blithely beating,
Wave advancing, wave retreating,
Praise ye, praise ye, God the Lord !

Rock and high land,
Wood and island,
Crag, where eagle's pride hath soared ;
Mighty mountains, purple-breasted,
Peaks cloud-cleaving, snowy-crested,
Praise ye, praise ye, God the Lord !

POETRY

THE CHARCOAL-BURNER

This most delightful study of an old charcoal-burner, attuned by long wont to his woodland surroundings, is from the graceful pen of Dr. Edmund Gosse, whom literary people of the twentieth century regard with affectionate admiration, both as a poet and a critic. The charcoal-burner stands before us as a proof of the poet's quality. How perfectly the old man blends with the rural scene! Compared with him the mere visitor is an alien in the woods. And the poet's comprehension of the man is as complete as the man's comprehension of the life of Nature.

HE lives within the hollow wood,
From one clear dell he seldom
ranges;
His daily toil in solitude
Revolves, but never changes.

A still old man, with grizzled beard,
Grey eye, bent shape, and smoke-tanned
features,
His quiet footstep is not feared
By shyest woodland creatures.

I love to watch the pale blue spire
His scented labour builds above it;
I track the woodland by his fire,
And, seen afar, I love it.

It seems among the serious trees
The emblem of a living pleasure,
It animates the silences
As with a tuneful measure.

And dream not that such humdrum ways
Fold naught of Nature's charm around
him;

The mystery of soundless days
Hath sought for him and found him.

He hides within his simple brain
An instinct innocent and holy,
The music of a wood-bird's strain,
Nor blithe, nor melancholy,

But hung upon the calm content
Of wholesome leaf and bough and
blossom:

An unecstatic ravishment
Born in a rustic bosom.

He knows the moods of forest things,
He feels, in his own speechless fashion,
For helpless forms of fur and wings
A mild paternal passion.

Within his horny hand he holds
The warm brood of the ruddy squirrel;
Their bushy mother storms and scolds,
But knows no sense of peril.

The dormouse shares his crumb of cheese,
His homeward trudge the rabbits follow;
He finds, in angles of the trees,
The cup-nest of the swallow.

And through this sympathy, perchance,
The beating heart of life he reaches
Far more than we who idly dance
An hour beneath the beeches.

Our science and our empty pride,
Our busy dream of introspection,
To God seem vain and poor beside
This dumb, sincere reflection.

Yet he will die unsought, unknown,
A nameless headstone stand above him,
And the vast woodland, vague and lone,
Be all that's left to love him.

THE ONE CLEAR CALL

We need an ever-present guide in times of doubt and difficulty, and in this poem Harold Begbie reminds us there is such a Guide for all of us. The one safe and conquering course is to do as we feel Jesus would have done.

MY son, when you stand looking right
and left,
Uncertain, tortured, which way you
should go,

So that your very soul in two seems cleft,
Your will a leaf in all the winds that
blow:

Then check the mill-race of your thoughts,
and strain

No more through tears the rightful
course to see,

But listen, silent, with a quiet brain
For the one faithful whisper *Follow Me*.

When you stand doubting in the storm of
life,

Troubled and harassed how a man
should act,

So that your brain is nothing but a strife
To tear away the Lie and face the Fact:

Then from the loud contention draw apart,
No longer beat your brain for a decree,
But wait with patience and a peaceful
heart

For the unerring whisper *Follow Me*.

There is no darkness on His road of light,
No doubt in hearts that follow where
He leads;

Each step makes clearer still the True and
Right,

Each act prepares the way for greater
deeds:

All's well! The lightnings and the
thunders cease,

The sky is fair, the stars no longer dim,
Heart, mind, and soul at last have lasting
peace,

And the man says, assured, *I follow
Him*.

POETRY

THE EXILE'S SONG

Robert Gilfillan was a Scottish poet, born in 1798, who, while acting as a grocer's shop assistant in Dunfermline and as a commercial clerk in Leith, gained considerable commendation for his songs. The best of them is this plaintive longing of a Scottish wanderer for Scotland. Where he is supposed to be is not easy to decide. It is a land of slavery where the bulbul sings to an Indian maid. What land, fit for a Scottish emigrant, can that be?

OH, why left I my hame?
 Why did I cross the deep?
 Oh, why left I the land
 Where my forefathers sleep?
 I sigh for Scotia's shore,
 And I gaze across the sea,
 But I canna get a blink
 O' my ain countrie!

The palm tree waveth high,
 And fair the myrtle springs;
 And to the Indian maid
 The bulbul sweetly sings;
 But I dinna see the broom
 Wi' its tassels on the lea,
 Nor hear the lintie's sang,
 O' my ain countrie!

Oh, here no Sabbath bell
 Awakes the Sabbath morn,
 Nor song of reapers heard
 Among the yellow corn;
 For the tyrant's voice is here,
 And the wail of slaverie;
 But the sun of freedom shines
 In my ain countrie.

There's a hope for every woe,
 And a balm for every pain,
 But the first joys o' our heart
 Come never back again.
 There's a track upon the deep,
 And a path across the sea;
 But the weary ne'er return
 To their ain countrie.

THE THREE BEST THINGS

In these three sonnets Dr. Henry van Dyke, the American poet, gives a complete chart for a whole life's guidance.

WORK

LET me but do my work from day to day,
 In field or forest, at the desk or loom,
 In roaring market-place or tranquil room;
 Let me but find it in my heart to say,
 When vagrant wishes beckon me astray,
 "This is my work; my blessing, not
 my doom;
 Of all who live, I am the one by whom
 This work can best be done in the right
 way."

Then shall I see it not too great nor small
 To suit my spirit and to prove my
 powers;
 Then shall I cheerful greet the labouring
 hours,
 And cheerful turn, when the long shadows
 fall
 At eventide, to play and love and rest,
 Because I know for me my work is best.

LOVE

Let me but love my love without dis-
 guise,
 Nor wear a mask of fashion old or new,
 Nor wait to speak till I can hear a clue,
 Nor play a part to shine in other's eyes,
 Nor bow my knees to what my heart
 denies;
 But what I am, to that let me be true,
 And let me worship where my love is
 due,
 And so through love and worship let me
 rise.

For love is but the heart's immortal thirst
 To be completely known and all for-
 given,
 Even as sinful souls that enter heaven:
 So take me, dear, and understand my
 worst,
 And freely pardon it, because confessed,
 And let me find, in loving thee, my best.

LIFE

Let me but live my life from year to year,
 With forward face and unreluctant
 soul;
 Not hurrying to, nor turning from, the
 goal;
 Not mourning for the things that dis-
 appear
 In the dim past, nor holding back in fear
 From what the future veils; but with a
 whole
 And happy heart, that pays its toll
 To Youth and Age, and travels on with
 cheer.

So let the way wind up the hill or down,
 O'er rough or smooth, the journey will
 be joy,
 Still seeking what I sought when but a
 boy,
 New friendship, high adventure, and a
 crown,
 My heart will keep the courage of the
 quest,
 And hope the road's last turn will be the
 best.

TO A NIGHTINGALE

John Keats was one of our greatest English poets. This poem is one of his masterpieces. It contains a number of allusions to the mythology, or fables, of ancient Greece, for Keats was steeped in the ancient lore we call "classical," and as a poet he was really more inspired and quickened by the spirit of old Greece than by that of his own time.

My heart aches, and a drowsy numbness
pains

My sense, as though of hemlock I had
drunk,
Or emptied some dull opiate to the drains
One minute past, and Lethe-wards had
sunk :

'Tis not through envy of thy happy lot,
But being too happy in thy happiness,
That thou, light-winged Dryad of the
trees,

In some melodious plot
Of beechen green, and shadows number-
less,
Singest of summer in full-throated
ease.

O for a draught of vintage ! that hath been
Cooled a long age in the deep-delvèd
earth,

Tasting of Flora and the country-green,
Dance, and Provençal song, and sun-
burnt mirth !

O for a beaker full of the warm South !
Full of the true, the blushful Hippocrene,
With beaded bubbles winking at the
brim,

And purple-stained mouth ;
That I might drink, and leave the world
unseen,
And with thee fade away into the
forest dim :

Fade far away, dissolve, and quite forget
What thou among the leaves hast never
known,

The weariness, the fever, and the fret
Here, where men sit and hear each other
groan ;

Where palsy shakes a few, sad, last grey
hairs,

Where youth grows pale, and spectre-
thin, and dies ;

Where but to think is to be full of
sorrow

And leaden-eyed despairs ;

Where beauty cannot keep her lustrous
eyes,

Or new Love pine at them beyond
tomorrow.

Away ! Away ! For I will fly to thee,
Not charioted by Bacchus and his pards,

But on the viewless wings of Poesy,
Though the dull brain perplexes and
retards :

Already with thee ! tender is the night,
And haply the Queen-Moon is on her
throne,

Clustered around by all her starry
Fays ;

But here there is no light,
Save what from heaven is with the
breezes blown

Through verdurous glooms and wind-
ing mossy ways.

I cannot see what flowers are at my feet,
Nor what soft incense hangs upon the
boughs,

But, in embalmèd darkness, guess each
sweet

Wherewith the seasonable month en-
dows

The grass, the thicket, and the fruit-tree
wild ;

White hawthorn, and the pastoral eglan-
tine ;

Fast fading violets covered up in
leaves ;

And mid-May's eldest child,
The coming musk-rose, full of dewy
wine,

The murmurous haunt of flies on
summer eves.

Darkling I listen ; and for many a time
I have been half in love with easeful
Death,

Called him soft names in many a musèd
rhyme,

To take into the air my quiet breath ;
Now more than ever seems it rich to die,

To cease upon the midnight with no pain,
While thou art pouring forth thy
soul abroad

In such an ecstasy !
Still wouldst thou sing, and I have ears
in vain—

To thy high requiem become a sod.

Thou wast not born for death, immortal
Bird !

No hungry generations tread thee down ;
The voice I hear this passing night was
heard

In ancient days by emperor and clown ;
Perhaps the self-same song that found a
path

Through the sad heart of Ruth, when,
sick for home,

She stood in tears amid the alien
corn :

POETRY

The same that oft-times hath
Charmed magic casements, opening on
the foam
Of perilous seas, in faery lands
forlorn.

Forlorn! The very word is like a bell
To toll me back from thee to my sole self!
Adieu! the fancy cannot cheat so well
As she is famed to do, deceiving elf.
Adieu! adieu! thy plaintive anthem fades
Past the near meadows, over the still
stream,
Up the hill-side; and now 'tis buried
deep
In the next valley-glades:
Was it a vision, or a waking dream?
Fled is that music: Do I wake or sleep?

THE CHAMBERED NAUTILUS

The nautilus is an eight-armed cuttle fish with a shell. It often floats on the surface of the sea, and the people of ancient Greece thought it raised sails and was blown along by the wind. They made a mistake. The so-called sails are its arms. As the nautilus grows it leaves the inmost recess of its spiral shell and forms a larger outer spiral chamber. Oliver Wendell Holmes in this poem refers to the ancient legend of the sails, and describes the stages of shell-building, thus leading up to the magnificent last verse, which contains one of the noblest similes to be found in all literature.

THIS is the ship of pearl, which, poets
feign,
Sails the unshadowed main—
The venturous bark that flings
On the sweet summer wind its purpled
wings
In gulfs enchanted, where the Siren sings,
And coral reefs lie bare,
Where the cold sea-maids rise to sun their
streaming hair.
Its webs of living gauze no more unfurl;
Wrecked is the ship of pearl!
And every chambered cell,
Where its dim dreaming life was wont to
dwell,
As the frail tenant shaped his growing
shell,
Before thee lies revealed,
Its irised ceiling rent, its sunless crypt
unsealed!
Year after year beheld the silent toil
That spread his lustrous coil;
Still, as the spiral grew,
He left the past year's dwelling for the
new,
Stole with soft step its shining archway
through,
Built up its idle door,
Stretched in his last-found home, and
knew the old no more.

Thanks for the heavenly message brought
by thee,
Child of the wandering sea,
Cast from her lap, forlorn!
From thy dead lips a clearer note is born
Than ever Triton blew from wreathed
horn!
While on mine ear it rings,
Through the deep caves of thought I hear
a voice that sings:

Build thee more stately mansions, O my
soul,
As the swift seasons roll!
Leave thy low-vaulted past!
Let each new temple, nobler than the last,
Shut thee from heaven with a dome more
vast,
Till thou at length art free,
Leaving thine outgrown shell by life's
unresting sea!

TOLERANCE

This plea for generous feeling towards all who are truly religious, whatever their faith may be, but also a defence of indignation against those who make religion a cloak for wrong, is made by Sir Lewis Morris, a poet who was popular in the last quarter of the 19th century. He died in 1907.

CALL no faith false which e'er has
brought
Relief to any laden life,
Cessation from the pain of thought,
Refreshment 'mid the dust of strife.

What though the thing to which they
kneel
Be dumb and dead as wood or stone,
Though all the rapture which they feel
Be for the worshipper alone?

They worship, they adore, they bow
Before the Ineffable Source, before
The hidden soul of good; and thou,
With all thy wit, what dost thou more?

Kneel with them, only if there come
Some zealot or sleek knave who strives
To mar the sanctities of home,
To tear asunder wedded lives;

Or who by subtle wile has sought,
By shameful promise, shameful threat,
To turn the thinker from his thought,
To efface the eternal landmarks set

'Twixt faith and knowledge; hold not
peace
For such, but like a sudden flame
Let loose thy scorn on him, nor cease
Till thou hast covered him with shame.

THE BLAME

Many people shirk blame that is their very own. Not so that firmly thoughtful Victorian poet John Addington Symonds. In these verses he braces us to face the fact that we are responsible for whatever we may do.

BLAME not the times in which we live,
Nor Fortune frail and fugitive :
Blame not thy parents, nor the rule
Of vice or wrong once learned at school ;
But blame thyself, O man !

Although both heaven and earth combined
To mould thy flesh and form thy mind,
Though every thought, word, action, will,
Was framed by powers beyond thee, still
Thou art thyself, O man !

And self to take or leave is free,
Feeling its own sufficiency :
In spite of science, spite of fate,
The judge within thee soon or late
Will blame but thee, O man !

A WALK IN SPRING

In these verses by M. A. Stodart the writer imagines the thoughts that come to a boy or girl when the chill days of winter have said good-bye and the smiling days of spring have come back again. The words are childlike, because they are supposed to be spoken by a very small child.

I'm very glad the spring is come—the sun
shines out so bright,
The little birds upon the trees are singing
for delight,
The young grass looks so fresh and green,
the lambkins sport and play,
And I can skip and run about as merrily
as they.
I like to see the daisy and the buttercups
once more,
The primrose and the cowslip too, and
every pretty flower ;
I like to see the butterfly fluttering her
painted wing,
And all things seem, just like myself, so
pleased to see the spring.
The fishes in the little brook are jumping
up on high,
The lark is singing sweetly as she mounts
into the sky ;
The rooks are building up their nests upon
the great tall tree,
And everything's as busy and as happy
as can be.
There's not a cloud upon the sky, there's
nothing dark or sad ;
I jump, and scarce know what to do, I feel
so very glad.
God must be very good indeed, Who made
each pretty thing :
I'm sure we ought to love Him much for
bringing back the spring.

THERE'S A LAND, A DEAR LAND

Charles Mackay the song writer, though not a great poet, had the power of writing with a manly swing which everyone can appreciate, and which carries us buoyantly along. This fine song of England is one of Mackay's best examples.

THERE'S a land, a dear land, where the
rights of the free,
Though firm as the earth, are as wide as
the sea ;
Where the primroses bloom, and the
nightingales sing,
And the honest poor man is as good as a
king.

Showery ! Flowery !

Tearful ! Cheerful !

England, wave-guarded and green to the
shore !

West Land ! Best Land !

Thy Land ! My Land !

Glory be with her, and Peace evermore !

There's a land, a dear land, where our
vigour of soul
Is fed by the tempests that blow from the
Pole ;

Where a slave cannot breathe, or invader
presume

To ask for more earth than will cover his
tomb.

Sea Land ! Free Land !

Fairest ! Rarest !

Home of brave men and the girls they
adore !

Fearless ! Peerless !

Thy Land ! My Land !

Glory be with her, and Peace evermore !

THE MILLER'S DAUGHTER

Here we have an example of Tennyson's early love songs. dainty and tender. The miller's daughter is not a real person but only an imaginary sweetheart.

Ir is the miller's daughter,
And she is grown so dear, so dear,
That I would be the jewel
That trembles in her ear :
For hid in ringlets day and night,
I'd touch her neck so warm and white.

And I would be the girdle
About her dainty, dainty waist,
And her heart would beat against me,
In sorrow and in rest :
And I should know if it beat right,
I'd clasp it round so close and tight.

And I would be the necklace,
And all day long to fall and rise
Upon her balmy bosom,
With her laughter or her sighs,
And I would lie so light, so light,
I scarce should be unclasped at night.

POETRY

ENGLAND'S DEAD

Never since the world began has any race of men strewed its dead so widely as the men of our Little Treasure Island. The frontier lines of our British dead, fallen in discovery, travel, business enterprise and war, have been finely commemorated by modern poets, particularly by Rudyard Kipling. But in a plain, open way Mrs. Hemans set the example in this poem, and not unworthily, for it is picturesque and vigorous as well as true.

SON of the ocean isle!
Where sleep your mighty dead?
Show me what high and stately pile
Is reared o'er Glory's bed.

Go, stranger! Track the deep,
Free, free, the white sail spread!
Wave may not foam, nor wild wind sweep,
Where rest not England's dead.

On Egypt's burning plains,
By the pyramid o'erswayed,
With fearful power the noonday reigns,
And the palm trees yield no shade;

But let the angry sun
From heaven look fiercely red,
Unfelt by those whose task is done!
There slumber England's dead.

The hurricane hath might
Along the Indian shore,
And far by Ganges' banks at night
Is heard the tiger's roar;

But let the sound roll on!
It hath no tone of dread
For those that from their toils are gone;
There slumber England's dead.

Loud rush the torrent-floods
The western wilds among,
And free, in green Columbia's woods,
The hunter's bow is strung;

But let the floods rush on!
Let the arrow's flight be sped!
Why should they reck whose task is done?
There slumber England's dead.

The mountain-storms rise high
In the snowy Pyrenees,
And toss the pine-boughs through the sky
Like rose-leaves on the breeze.

But let the storm rage on!
Let the forest-wreaths be shed:
For the Roncesvalles' field is won;
There slumber England's dead.

On the frozen deep's repose,
'Tis a dark and dreadful hour,
When round the ship the ice-fields close,
To chain her with their power.

But let the ice drift on!

Let the cold-blue desert spread!
Their course with mast and flag is done;
Even there sleep England's dead.

The warlike of the isles,
The men of field and wave!
Are not the rocks their funeral piles,
The seas and shores their grave?

Go, stranger! track the deep,
Free, free, the white sails spread!
Wave may not foam, nor wild wind sweep,
Where rest not England's dead.

THE HEAVENS IN LONDON TOWN

This poem by Edward Shillito, the well-known Congregational minister, takes us back to the nights when under the terrors of war from the skies the lights of London were darkened or put out. Then the stars reappeared in London's midnight sky, and the poet felt he was seeing London canopied by night as Alfred, Raleigh, Shakespeare, Wesley, and Keats had seen it. So he treasured the memory of their companionship in the gloom against the coming nights when once more London's glare of lights would shine forth and obscure the deep peace of the stars.

BEFORE the winter's haunted nights are
o'er

I thankfully rejoice that stars look down
Above the darkened streets, and I adore
The Heavens in London Town.

The Heavens beneath which Alfred stood
when he
Built ramparts by the tide against his
foes,
The skies men loved when in eternity
The dream-like Abbey rose.

The Heavens whose glory has not known
increase
Since Raleigh swaggered home by
lantern-light,
And Shakespeare, looking upwards, knew
the peace,
The cool, deep peace of night.

Under those Heavens brave Wesley rose
betimes
To preach ere daybreak to the tender
soul;
And in the heart of Keats the starry
rhymes
Rolled, and for ever roll.

I, too, have walked with them the heavenly
ways,
Tracing the sweet embroideries of the
sky,
And I shall not forget when arcs shall
blaze,
And all the lights are high.

MY LAND

Irish poets have been very faithful to their Motherland. This is the tribute paid to her by Thomas Davis, a poet and patriot who died in 1845, when only thirty years old. It has in it an echo of a song by Robert Burns.

SHE is a rich and rare land ;
O, she's a fresh and fair land ;
She is a dear and rare land,
This native land of mine.

No men than hers are braver,
Her women's hearts ne'er waver ;
I'd freely die to save her,
And think my lot divine.

She's not a dull or cold land ;
No! she's a warm and bold land ;
O! she's a true and old land,
This native land of mine.

Could beauty ever guard her,
And virtue still reward her,
No foe would cross her border,
No friend within it pine.

O, she's a fresh and fair land,
O, she's a rare and true land !
Yes, she's a rare and fair land,
This native land of mine.

MY WILL

This delightful picture of a country life by choice for settling down in, good unto the end, is from the charming pen of Dr. Arthur Christopher Benson, son of an Archbishop of Canterbury and himself Master of Magdalene College, Cambridge. Instead of living as he would according to this poem, the writer spends a bachelor life in the seasoned respectability of college buildings. But his dream makes a pleasing and enviable picture, none the less.

I WOULD live, if I had my will,
In an old stone grange on a York-
shire hill,
Ivy-encircled, lichen-streaked,
Low and mullioned, gable-peaked,
With a velvet lawn, and a hedge of yew,
An apple orchard to saunter through,
Hyacinth-scented in spring's clear prime,
And rich with roses in summer-time,
And a waft of heather over the hill,
Had I my will.

Over the tree-tops, grave and brown,
Slants the back of a breezy down ;
Through my fields, by the covert edge,
A swift stream splashes from ledge to
ledge,
On to the hamlet, scattered, gray,
Where folk live leisurely day by day ;
The same old faces about my walks ;
Smiling welcomes and simple talks ;
Innocent stories of Jack and Jill ;
Had I my will.

How my thrushes should pipe ere noon,
Young birds learning the old birds' tune !
Casements wide, when the eve is fair,
To drink the scents of the moonlit air.
Over the valley I'd see the lights
Of the lone-hill farms, on the upland
heights ;
And hear, when the night is alert with rain,
The steady pulse of the labouring train,
With the measured gush of the merry rill,
Had I my will.

Then in the winter, when gusts pipe thin,
By a clear fire would I sit within,
Warm and dry in the ingle nook,
Reading at ease in a good, grave book ;
Under the lamp, as I sideways bend,
I'd scan the face of my well-loved friend ;
Writing my verses with careless speed,
One, at least, would be pleased to read :
Thus sweet leisure my days should fill
Had I my will.

Then when the last guest steps to my side—
May it be summer, the windows wide—
I would smile as the parson prayed,
Smile to think I was once afraid ;
Death should beckon me, take my hand,
Smile at the door of the silent land ;
Then the slumber, how good to sleep
Under the grass where the shadows creep,
Where the headstones slant on the wind-
swept hill !
I shall have my will !

REMEMBER

This tender sonnet, written by Christina Rossetti, is in the tone of gentle sadness felt in many of her writings. Miss Rossetti was a sister of Dante Gabriel Rossetti, who was known as a poet and painter in mid-Victorian days.

REMEMBER me when I am gone away,
Gone far away into the silent land ;
When you can no more hold me by the
hand,
Nor I half turn to go, yet turning stay.
Remember me when no more day by day
You tell me of our future that you
planned :
Only remember me ; you understand
It will be late to counsel then or pray.
Yet if you should forget me for a while
And afterwards remember, do not
grieve :
For if the darkness and corruption leave
A vestige of the thoughts that once I
had,
Better by far you should forget and smile
Than that you should remember and be
sad.

HICKORY, DICKORY DOCK



Hick - or - y, Dick - or - y Dock ! The
 mouse ran up the clock. . . The clock struck one, The
 mouse ran down, Hick-or-y, Dick - or - y Dock.

The illustration features a woman in a bonnet and dress on the left, a large grandfather clock on the right, and a dog jumping at the bottom.

WARM HANDS, WARM



Warm hands, warm, The men are gone to plough,
 If you want to warm your hands, warm your hands now.

The illustration shows a woman on the left looking into a fireplace, three children sitting on a bench in the center, and a woman on the right holding a pitcher.

LITTLE VERSES FOR VERY LITTLE PEOPLE

THE FUNNY LITTLE FELLOW

'Twas a Funny Little Fellow
Of the very purest type,
For he had a heart as mellow
As an apple over-ripe,
And the brightest little twinkle
When a funny thing occurred,
And the lightest little tinkle
Of a laugh you ever heard!
His smile was like the glitter
Of the sun in tropic lands,
And his talk a sweeter twitter
Than the swallow understands;
Hear him sing and tell a story,
Snap a joke, ignite a pun,
'Twas a capture, rapture, glory,
And explosion—all in one!
Though he hadn't any money—
That condiment which tends
To make a fellow "honey"
For the palate of his friends—
Sweet simples he compounded,
Sovereign antidotes for sin
Or taint, a faith unbounded
That his friends were genuine.
He wasn't honoured, maybe,
For his songs of praise were slim,
Yet I never knew a baby
That wouldn't crow for him;
I never knew a mother
But urged a kindly claim
Upon him as a brother
At the mention of his name.
The sick have ceased their sighing,
And have even found the grace
Of a smile when they were dying
As they looked upon his face;
And I've seen his eyes of laughter
Melt in tears that only ran
As though, swift-dancing after,
Came the Funny Little Man.
He laughed away the sorrow
And he laughed away the gloom
We are all so prone to borrow
From the darkness of the tomb;
And he laughed across the ocean
Of a happy life, and passed,
With a laugh of glad emotion,
Into Paradise at last.
And I think the Angels knew him,
And had gathered to await
His coming, and run to him
Through the widely-opened Gate,
With their faces gleaming sunny
For his laughter-loving sake,
And thinking "What a funny
Little Angel he will make!"

James Whitcomb Riley

WEIGHING THE BABY

How many pounds does the baby
weigh,
Baby who came but a month ago?
How many pounds from the crowning curl
To the rosy point of the restless toe?
Grandfather ties the 'kerchief knot,
Tenderly guides the swinging weight,
And carefully over his glasses peers
To read the record, "only eight."
Softly the echo goes around:
The father laughs at the tiny girl;
The fair young mother sings the words,
While grandmother smooths the golden
curl:
And, stooping above the precious thing,
Nestles a kiss within a prayer,
Murmuring softly, "Little one,
Grandfather did not weigh you fair."
Nobody weighed the baby's smile,
Or the love that came with the helpless
one;
Nobody weighed the threads of care
From which a woman's life is spun.
No index tells the mighty worth
Of a little baby's quiet breath,
A soft, unceasing metronome,
Patient and faithful until death.
Nobody weighed the baby's soul,
For here on earth no weights there be
That could avail; God only knows
Its value in eternity.
Only eight pounds to hold a soul
That seeks no angel's silver wing,
But shrines it in this human guise,
Within so frail and small a thing!
Oh, mother! laugh your merry note,
Be gay and glad, but don't forget
From baby's eyes looks out a soul
That claims a home in Eden yet.

Ethel Lynn Beers

BARTHOLOMEW

BARTHOLOMEW is very sweet,
From sandy hair to rosy feet.
Bartholomew is six months old,
And dearer far than pearls or gold.
Bartholomew has deep blue eyes,
Round pieces dropped from out the skies.
Bartholomew is hugged and kissed:
He loves a flower in either fist.
Bartholomew's my saucy son:
No mother has a sweeter one!

Norman Gale

Imperishable Thoughts of Men Enshrined in the Books of the World

Shakespeare's Tragedies

WE have already read the stories of ten of Shakespeare's plays, and five more are told here. But we must bear in mind that most of Shakespeare's comedies and tragedies were founded on stories he did not invent himself. Some of the stories had been favourites on the Continent and in England long before the poet made use of them for his plays. They might have been forgotten for ever if he had not retold them by means of the characters he created, and in his own wonderfully beautiful language. He wrote both tragedies and comedies, and he excelled all the other dramatists the world has known by being equally great in tragedy and in comedy. A tragedy is a poetic play in which the characters suffer heavy sorrow, some of the chief persons die, and the end is sadness. A comedy is a play in which all ends happily. The first plays we read were all comedies, but here we read the stories of five tragedies, *Romeo and Juliet*, *Hamlet*, *Othello*, *Macbeth*, and *King Lear*.

ROMEO AND JULIET

IN the ancient Italian town of Verona lived two noble families at deadly enmity with each other. One family was named Montague, and the other Capulet.

Romeo, the brave and handsome youth, heir of the Montagues, was in love with a lady called Rosaline; but she refused to have anything to do with him, which made him so sorrowful that he shunned all gaiety and lay sleepless at nights. It chanced one day, when Romeo was speaking in the street with his cousin Benvolio, that a servant came to him, asking if he could read a paper he carried, on which were the names of the guests to whom he was bearing invitations to a ball given by the great Capulet. Romeo noticed Rosaline was to be among the guests, whereon Benvolio suggested they should go to the ball masked, and that when Romeo saw the many lovely ladies who would be there he might forget the disdainful Rosaline.

The lover thought it would be impossible ever to forget Rosaline; but when, in due time, he was mingling with the dancers in his foeman's house, he saw a lady who was so fair that she seemed to be "a snowy dove trooping with crows," and he determined that he would speak to her as soon as he could. While asking a servant the name of the fair one, Tybalt, a young Capulet, recognised Romeo's voice, and wanted to chal-

lenge him; but the lord of the house kept him back, saying that Romeo bore himself like a gentleman, and was said to be "a virtuous and well-governed youth."

Romeo had now come up to the fair lady, and, kissing her hand, had spoken a few words of admiration, and received the assurance that he was not displeasing to her. But when he knew that she was none other than Juliet, the only child of Capulet, he was very sad. For he had fallen in love with the daughter of his father's mortal enemy.

At midnight Romeo departed, but he felt that he could not go homeward and leave the place where Juliet was; so he climbed over the orchard wall into Capulet's garden, and while he was hidden by the darkness of the night he saw the lady appearing at the window. She called his name to the night air, saying:

O Romeo, Romeo! Wherefore art thou Romeo?
Deny thy father, and refuse thy name;
Or, if thou wilt not, be but sworn my love,
And I'll no longer be a Capulet.

When she had spoken more words in this strain, Romeo stepped forward and told her that his name was now hateful to himself as it was that of her family's enemies. That night they vowed their love for each other, and decided to be married at all risks.

In the early morning we next see Romeo at the cell of Friar Laurence,

a priest who thought the lover had come from his usual sleepless night weeping over Rosaline's hardness. He was surprised to hear of the new love, but rejoiced to think that now, perhaps, the feud between the Capulets and the Montagues would come to an end with the union of this couple. Willingly he consented to marry them secretly.

ROMEO LEAVES HIS BRIDE AND FLEES TO MANTUA

Before long Juliet arrived, and presently the priest had made her Romeo's bride.

Soon after this, Romeo's friend, Mercutio, a kinsman of the Prince of Verona, and a very quick-tempered man, engages in a quarrel with Tybalt, and Romeo appears on the scene. Tybalt immediately turns on Romeo, who, having so lately wedded a Capulet, now feels kindly towards the family, and refuses the challenge. Thereupon Mercutio draws his sword on Tybalt, who kills him.

Romeo could not let his friend's death pass unavenged, and, scarcely had he slain Tybalt, than the Prince arrived. He had long been vexed by these family feuds, and now his displeasure was so great that he banished Romeo.

Friar Laurence advised Romeo to flee to Mantua, and there to wait until he could make his marriage known, implore the Prince's pardon, and come back to Verona. Juliet's old nurse brought Romeo a ring from his young bride, and after a brief meeting with Juliet he hastened from Verona.

Juliet was plunged in sorrow, but her mother thought it was for the death of her cousin Tybalt; and when a young nobleman named Paris asked for her daughter's hand, Lady Capulet agreed that they should be married within a few days.

THE OLD FRIAR'S RUSE TO SAVE JULIET FROM COUNT PARIS

At first Juliet refused, and then she went to take counsel of the Friar, saying she would kill herself rather than be married to Paris. As a desperate plan of escape the Friar gave her a phial, from which she was to drink on the eve of the wedding her mother had arranged. It contained a drug which would make her fall into a trance with all the appearance of death, and she would then be taken to the family vault. Meanwhile, Friar Laurence was to send for Romeo, and when Juliet had awakened from her long sleep

her lover would be by her side ready to take her with him to Mantua.

The strange and dangerous scheme of the Friar was carried out so far that Romeo came to the tomb after Juliet had been placed in it; but he had come thinking she was really dead, and had provided himself with poison that he might die beside her. Paris, however, was there before him, having come to strew flowers on Juliet's coffin. The two men quarrelled and fought at the grave, Paris being killed.

When Romeo had opened the vault he laid the body of Paris beside that of Tybalt, and then he gazed on the beautiful face of his wife, kissed her for the last time, and drank the poison, saying:

Eyes, look your last!
Arms, take your last embrace! and lips, O you,
The doors of breath, seal with a righteous kiss
A dateless bargain to engrossing death!

Here's to my love! O true apothecary!
Thy drugs are quick. Thus with a kiss I die.

THE END OF THE HATRED OF THE TWO OLD FAMILIES

Romeo had been in the tomb for half an hour when Friar Laurence came to find Juliet, as it was now time she should recover. On entering the vault he saw Romeo lying near the blood-stained Paris, and called anxiously to Juliet to arise, for she was now beginning to show signs of life. She awoke, and he told her that if she would but come, he would put her "among a sisterhood of holy nuns." But, hearing the sound of approaching footsteps, he fled.

When the sight of her dead Romeo and the bleeding Paris met the awakened eyes of Juliet, she snatched up Romeo's dagger and stabbed herself.

The watchman came in, and then they summoned the Montagues and Capulets, and the Friar was brought back. He explained to the astonished company the cause of the tragedy, and when the Prince reproached them with the death of the youthful lovers on account of the feud between the families, Montagues and Capulets alike were stricken with remorse.

Montague reared to the true and faithful Juliet a statue of pure gold, and the same honour was paid to Romeo by Capulet. Thus ended the rivalry and hatred of the two families.

HAMLET, PRINCE OF DENMARK

PRECISELY as the clock struck midnight the ghost of the former King of Denmark used to appear on the walls of the Castle of Elsinore.

Scared soldiers of the guard told Prince Hamlet of this, and he determined to speak to his father's spirit next time it appeared. For this purpose he waited through the cold, dark night until the midnight hour, when the ghost was seen beckoning to him. His faithful officers would have detained him, but Hamlet broke from them and went after the spirit.

Hamlet had been so full of love for his father that his grief for the King's death two months before had increased daily, and was now mingled with horrified anger at his own mother Queen Gertrude, and his father's brother Claudius, who had married the Queen in less than two months after the death of the King.

The young Prince's mind was full of unrest at this disgraceful conduct, and he was suspicious as to the death of his father; so that when the spirit revealed to him the fact that he had been poisoned by his brother, in order that the brother might wed his Queen and sit on his throne, Hamlet's whole thoughts turned bitterly to means of vengeance. Encouraged by his father's spirit, he resolved never to rest till the usurper had paid for his crime; and, the better to carry out his plans, he feigned madness, speaking strangely even to Ophelia, a beautiful maiden he loved.

It chanced that a company of players came to the castle, and Hamlet, looking every way for means to convict the new King of his crime, conceived that by means of these play-actors he might reveal his knowledge of his evil deeds.

With this end in view Hamlet arranged that the company should perform the next day a play dealing with the murder of a Duke of Venice, and that into this some new lines which Hamlet was to write should be introduced. We can guess that these lines would refer to a King poisoned by his brother so that the brother might enjoy his possessions and wed his widow; for Hamlet exclaimed, when he had made this arrangement with the players:

The play's the thing

Wherein I'll catch the conscience of the king.

And so it all falls out. When the tragedy is performed before the King and Queen the mimic deeds enacted on the stage are, in every detail, so like the manner in which Hamlet's father had been slain, by the pouring of a poisonous drug into his ear as he lay asleep, that the guilty Claudius and Gertrude can stand it no longer, and leave the room in great excitement and disorder. The play had caught the conscience of the treacherous King!

In great agitation Claudius expressed to Queen Gertrude his wrath against Hamlet, and bade her reprimand her son for his conduct. She summoned

Hamlet to her private apartment; but Ophelia's father, the aged Polonius, who was Lord Chamberlain of the kingdom, remained hidden behind a curtain, fearing lest some violence might result from the Prince's supposed madness. When the Queen reproved her son for having the play performed, he straightway told her that he would not let her go until he had set up a glass where she might see the inmost part of herself. So wild were his words that the Queen, fearing he would kill her, called for help, and



HAMLET AND HORATIO WATCH THE GRAVEDIGGERS AT WORK

Polonius echoed the call. Hamlet, pretending that the disturbance was created by a rat behind the curtain, thrust in his sword and killed the old courtier. Then, with wild, strange words of scorn, he reproached his mother till she entreated him to speak no more.

But sad was the fate that befell the beautiful Ophelia. Believing her lover's affection to have turned to hatred, and hearing of her father's death at his hand, she could do naught but brood over her woes, till at last her mind gave way.

King Claudius, of course, had but one thought now—to be rid of Hamlet, whom he believed to possess his secret. The Prince was sent to England with a sealed letter from Claudius, in which the King desired that Hamlet should be put to death on landing. But this was not to be. The ship bearing the Prince was attacked by pirates, who took all on board prisoners, eventually restoring Hamlet to Denmark. Returning to Elsinore with his faithful friend Horatio, they entered a churchyard where a new grave was being dug, and there they stood watching the gravediggers, little dreaming for whom the grave was being made. Presently appeared a funeral procession. Hamlet and his friend withdrew, but from their hiding-place they saw the corpse of Ophelia borne in the midst. That unhappy girl had been drowned while gathering flowers by the side of a brook.

Tenderly the body was laid in the grave; but Laertes, Ophelia's brother, distraught at her death, threw himself

on her body and begged that he might be buried with her. Hamlet then ran forward and leapt in beside the living and the dead. A fierce struggle ensued, Laertes accusing Hamlet of his sister's death, because his conduct had turned her mind. But in the end they all withdrew, and Ophelia was left in her grave.

A duel, however, had to be fought between Hamlet and Laertes, and the whole Court assembled to watch the fateful combat. Claudius hoped it would rid him of Hamlet, and caused a cup of poisoned wine to be placed in readiness for the Prince, that he might drink it when exhausted, in case he overcame Laertes, for whose use a poisoned rapier had been provided. In the struggle Laertes and Hamlet unknowingly changed swords, but not before the Prince had received a wound from the poisoned point; and Laertes, in his turn, was next wounded with the same sword. Meanwhile, Queen Gertrude, drinking in honour of her son's clever swordsmanship, partook of the deadly wine intended for another and died.

The death of his mother showed Hamlet the last villainy of the wicked Claudius, which had entirely miscarried and robbed him of his Queen. Laertes, dying, forgave the Prince, and seeing all clear at the last, he denounced the King as the cause of all their woe; while Hamlet, turning his steel on Claudius, made the murderer drink the deadly cup himself; and presently, Hamlet's own wound taking effect, the chief actor in this strange, sad tragedy breathed his last.

OTHELLO, THE MOOR OF VENICE

THE city of Venice, though now only one of the many beautiful towns of Italy, was formerly the scene of a great republican government that sent its ambassadors to the mighty nations of the world and ruled over many other towns as well as Venice itself, while its ships traded to far countries, and its soldiers and sailors won colonies in other lands.

In these great days a Moor, or dark-skinned man from the north of Africa, named Othello, was a brilliant leader of the army of Venice. He was a man of noble mind, despite his black skin, and so able that he was sent to be governor of Cyprus, which then belonged to Venice.

Now, in addition to all his triumphs as a soldier, Othello had the fortune to win

the love of one of the most beautiful women in Venice, whose name was Desdemona, the daughter of Brabantio, a senator, or member of the Government of Venice. It may seem strange that a black man should be loved by a fair lady who had refused many rich suitors; but she thought more of his noble mind than of his looks, and all her delight was to listen to his thrilling tales of the battles in which he had fought, of his hairbreadth escapes, of the strange adventures through which he had passed by land and sea.

But her father, Brabantio, did not know of the things she kept hidden in her heart, as she knew he would never approve of her wedding the Moor. His anger was terrible when one night he was awakened

by two men, who told him that Desdemona had left him and was now married to Othello. One of these men was Iago, who long had served the Moor as one of his officers, but who now hated him bitterly, since Othello had chosen Cassio as his lieutenant when Iago thought he should have been preferred. Iago was cunning, spiteful, and capable of any villainy; while Cassio was frank and open, but easily led astray.

**THE SPLENDID SPEECH OF THE MOOR
IN DEFENCE OF HIS MARRIAGE**

Brabantio appeared against Othello to the Duke of Venice and the senators, who at first were in his favour. But Othello answered the charge of stealing away Desdemona in so many a way that the Duke and others were soon won to his side, especially as Desdemona herself proved that she loved the gallant Moor and was proud to be his wife.

Here is the speech in which Othello made his courteous but bold defence.

Most potent, grave, and reverend signiors,
My very noble and approved good masters,
That I have taken away this old man's daughter,
It is most true; true, I have married her;
The very head and front of my offending
Hath this extent, no more. Rude am I in my
speech,
And little blessed with the soft phrase of peace;
For since these arms of mine had seven years'
pith,
Till now some nine moons wasted, they have
used
Their dearest action in the tented field;
And little of this great world can I speak
More than pertains to feats of broil and battle;
And therefore little shall I grace my cause
In speaking for myself. Yet, by your gracious
patience,
I will a round, unvarnished tale deliver
Of my whole course of love; what drugs, what
charms,
What conjuration, and what mighty magic,
For such proceeding I am charged withal,
I won his daughter.

Her father loved me; oft invited me;
Still questioned me the story of my life
From year to year, the battles, sieges, fortunes
That I have passed.
I ran it through, even from my boyish days
To the very moment that he bade me tell it;
Wherein I spake of most disastrous chances,
Of moving accidents by flood and field,

Of hairbreadth escapes in the imminent deadly
breach,

Of being taken by the insolent foe
And sold to slavery, of my redemption thence
And portance in my travel's history;
Wherein of antres vast and deserts idle,
Rough quarries, rocks and hills whose heads
touch heaven,

It was my hint to speak, such was the process;
And of the Cannibals that each other eat,
The Anthropophagi, and men whose heads
Do grow beneath their shoulders. This to hear
Would Desdemona seriously incline;
But still the house-affairs would draw her
thence;

Which ever as she could with haste dispatch,
She'd come again, and with a greedy ear
Devour up my discourse. Which I observing,
Took once a pliant hour, and found good means
To draw from her a prayer of earnest heart
That I would all my pilgrimage dilate,
Whereof by parcels she had something heard.
But not intently; I did consent,
And often did beguile her of her tears
When I did speak of some distressful stroke
That my youth suffered. My story being done,
She gave me for my pains a world of sighs;
She swore, in faith, 'twas strange, 'twas passing
strange;

'Twas pitiful, 'twas wondrous pitiful;
She wished she had not heard it, yet she wished
That heaven had made her such a man; she
thanked me,
And bade me, if I had a friend that loved her,
I should but teach him how to tell my story,
And that would woo her. Upon this hint I
spake;

She loved me for the dangers I had passed,
And I loved her that she did pity them.

That very night the devotion of Othello
to the country he had served so well was
put once more to the test, as he was
ordered off to defend Cyprus, which was
in danger of being attacked by the Turks.

**THE CRAFTY IAGO SEEKS TO RUIN
HIS ENEMY CASSIO**

The great soldier at once sets out for
Cyprus, Desdemona being left in the care
of "honest Iago," as Othello still thinks
him faithful, and Iago's wife, Emilia, is
asked to attend on Desdemona. Cassio
follows in another vessel; Iago, with
Desdemona, setting sail in a third. Cassio
is the first to arrive, his vessel having lost
Othello's in a storm, and Iago, who "has
had most favourable and happy speed,"

reaches the island before the Moor. Iago's hatred of Cassio for having been preferred by Othello is speedily seen, and his crafty mind is at work to ruin the lieutenant, whom Desdemona treats with greater friendliness than she does Iago.

When Othello arrived, soon after Desdemona, he was not displeased to hear that the Turkish ships had all been shattered in the storm which had so nearly wrecked his own vessel, for now he was able to devote more time to his bride, "my fair warrior," as he lovingly called her. On the night of his arrival he bade Cassio keep order in the castle, and see there should be no disturbance among the soldiers. The crafty Iago, however, now began to work his plot, plying the luckless Cassio with wine until he became intoxicated, and in a drunken brawl wounded Montano, the governor of the island, whom Othello was to replace.

Coming on the scene of the disgraceful brawl, Othello heard an account of it from Iago, who was the cause of all the trouble; and, thinking Iago was trying to shield Cassio by making light of the matter, he said, with sorrow, "Cassio, I love thee, but never more be officer of mine," appointing Iago to the charge of the guard. Thus, the first part of the villain's scheme of treachery had succeeded. But worse, far worse, was yet to come.

Poor Cassio now appealed to Desdemona that she might intercede with her husband on his behalf. This the gentle Desdemona did, but Iago's new villainy was to make Othello believe she pleaded for Cassio because she had fallen in love with him. So well did he instil the poison of doubt into Othello's mind that at length the Moor began to lose faith in his wife, and, believing she had ceased to love him, became almost mad with jealousy.

Chance favoured the evil designs of Iago, as it so happened that, before they were married, Othello had given Desdemona a beautifully-worked handkerchief supposed to be of magic power, to make its owner loved and amiable; but to

make her become hateful to her lover if ever she should lose it. Iago longed to possess this, and urged his wife to steal it.

One day, when Othello was in an ill mood of doubting, and complained of a pain in his head, Desdemona offered him the handkerchief; but he put it from him, saying, "Your napkin is too little," and it fell to the floor, where Emilia quickly picked it up and passed it to Iago. This fateful little handkerchief now became a tool of great mischief, as it was conveyed to Cassio's house by Iago; and poor Cassio, finding it, presented it to a woman as a pretty thing, not knowing to whom it had belonged, and still less guessing that Othello had been brought by Iago to watch him with the handkerchief, as a proof that Cassio had received from Desdemona a gift she should have esteemed so precious.

Othello, now believing that his wife had ceased to love him, determined to kill her; but as she lay asleep in bed he bent over her and kissed her, she looked so beautiful. His kiss awakened her, and in answer to her frightened questions he bade her say her prayers, telling her he knew of her love for Cassio. In vain did poor Desdemona plead her innocence; her jealous husband covered her with the bedclothes and smothered her.

She was not yet dead when Emilia got into the room and told of her husband Iago's evil doings, exclaiming that the misguided Moor had murdered a saint, whose last words were of love for Othello.

Iago, who has come in, stabs his wife for denouncing him, and then runs out; but others arrive, and Iago is brought back, Othello in his anger wounding him.

Realising in an awful agony how beguiled he had been to trust so vile a man and mistrust so good a wife, Othello stabbed himself, and, falling upon the body of his innocent bride, exclaimed with his dying breath:

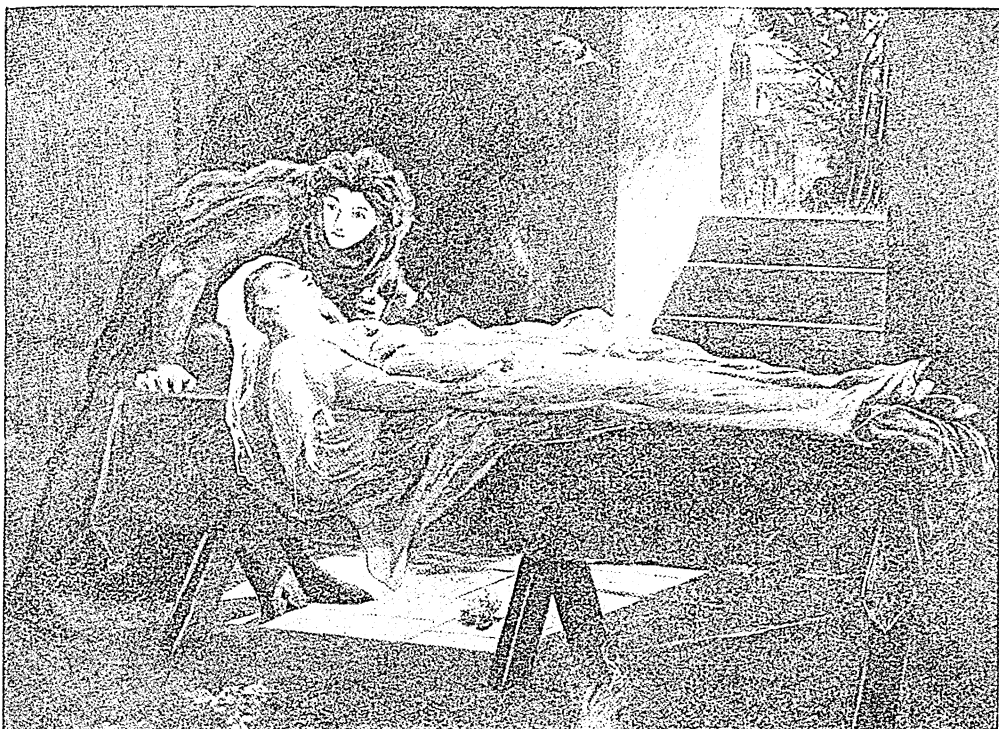
I kissed thee ere I killed thee; no way but this,
Killing myself, to die upon a kiss.

MACBETH

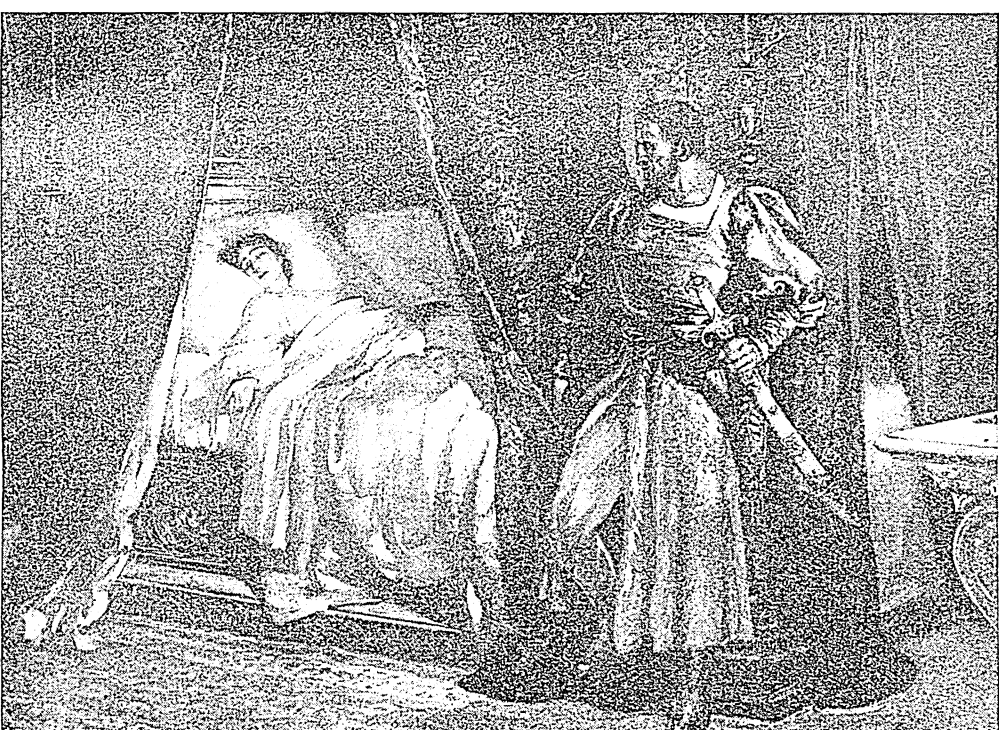
DUNCAN, King of Scotland, was harassed by rebellion and invasion, but both rebels and invaders were routed by his brave generals, Macbeth and Banquo. When the news of Macbeth's victories came to Duncan, he gave the title of the defeated rebel lord to Macbeth.

Returning from the battlefield and not knowing of his new honours, Macbeth, while crossing a weird heath, came upon three witches, who greeted him as Thane of Glamis, a title to which he knew he had succeeded, but also as Thane of Cawdor, of which he had not heard. Then

SCENES FROM SHAKESPEARE'S TRAGEDIES



ROMEO AT THE TOMB OF JULIET—FROM ROMEO AND JULIET



OTHELLO WATCHES THE SLEEPING DESDEMONA—FROM OTHELLO, THE MOOR OF VENICE

they added that he should be King hereafter. Almost as soon as the witches disappeared, messengers arrived from King Duncan to announce Macbeth's new honour as Thane of Cawdor. This set him wondering whether the final prophecy of the kingship could be true, and he at once wrote to his wife to tell her the strange news.

When the King had met Macbeth, and confirmed his honours, the route of the King's journey led by Macbeth's castle, and the general hastened forward to prepare to receive the King as his guest. As he arrived at the castle Lady Macbeth was reading the letter in which the prophecy of the witches was told. She was much more prompt in action and bold in execution than her husband, and the moment she heard of the prophecy and of King Duncan's approach, she decided that he should never leave the castle alive. When her husband approached she greeted him as

Great Glamis! worthy Cawdor!
Greater than both, by the all-hail hereafter!
and instantly revealed her dreadful intention of quick murder.

THE TERRIBLE DEED BY WHICH MACBETH BECAME KING OF SCOTLAND

That night, after the aged Duncan had behaved most graciously to his host and hostess, he was murdered by Macbeth, acting under the imperious will of his wife, who declared that she would have done it if Duncan had not resembled her father as he slept. The guards outside the King's chamber had been made drunk, and by them the blood-stained daggers were laid.

When other visitors arrived and roused the inmates of the castle during the night, Macbeth and his wife appeared, and Macbeth, pretending to have been moved by instant fury, concealed his part in the murder by killing the sleeping guards outside the room. The play shows the working of remorse in the minds of the guilty pair, who had been faithless to the King in order to fulfil the prophecy of the witches and make way for Macbeth to take the kingship. Macbeth now succeeds Duncan as King; but he still has a trouble on his mind besides the memory of his guilt. The witches had followed their prophecy that he would be King, by adding that Banquo's descendants would be kings, and Banquo would be happier than Macbeth.

To defeat this prophecy Macbeth arranges that Banquo and his son shall be

murdered. Macbeth now becomes more and more uneasy as he contemplates his crimes. He even envies his victims:

Duncan is in his grave;
After life's fitful fever he sleeps well;
Treason has done his worst; nor steel, nor
poison,
Malice domestic, foreign levy, nothing
Can touch him further.

But neither Macbeth nor his wife can sleep well. Still she urges him on, and especially conjures him to be genial at the great banquet they are giving that night, with Banquo as one of the guests.

THE MYSTERIOUS PROPHECIES OF THE THREE WITCHES

Meantime, lurking murderers have sprung upon Banquo and killed him as he approached the palace. But his son Fleance escapes, and still leaves room for the fulfilment of the witches' prophecy. At the banquet the ghost of Banquo takes his seat at the table, seen by the horrified Macbeth, but unseen by the rest of the guests. Under his terror at this apparition Macbeth behaves so strangely that only the self-possession of his wife prevents suspicion from being aroused. In his nervous distress under the remorse he feels Macbeth again seeks the witches, who urge him on by mysterious prophecies which he does not understand. They tell him, for instance, that he shall never be vanquished till Birnam Wood shall come to his castle of Dunsinane. Meantime, Macbeth's enemies are gathering strength around him.

At last even the resolution of Lady Macbeth gives way. She walks in her sleep, and tries to wash bloodstains from her hands as she walks. Conscience is at work, and when Malcolm, son of Duncan, who has come, with English help, to depose the usurper, approaches Dunsinane, Macbeth has no longer her support; indeed, the news of her death reaches him as he is preparing for his final defence.

THE CRY OF DESPAIR FROM A MAN OVERTHROWN BY HIS AMBITION

He hears the news as a thoroughly disillusioned man who by his misuse of life has found it meaningless. This is all he has to say of it—the outcry of a man wrecked by a false ambition:

Tomorrow, and tomorrow, and tomorrow,
Creeps in this petty pace from day to day,
To the last syllable of recorded time;
And all our yesterdays have lighted fools
The way to dusty death. Out, out, brief candle!

Life's but a walking shadow, a poor player
That struts and frets his hour upon the stage,
And then is heard no more ; it is a tale
Told by an idiot, full of sound and fury,
Signifying nothing.

But though he is hopeless at the last he loses not his soldierly courage, but is braver than he was when murder of the helpless was his aim. Even when he heard that Birnam Wood was coming to Dunsinane, for the enemy were carrying

great boughs from it to conceal their numbers, he did not quail, but exclaimed :

Ring the alarum-bell ! Blow, wind ! Come, wrack ;

At least we'll die with harness on our back.

And rushing forth, he died in single combat with his deadly foe Macduff, whose family he had slain. And so the retribution for a life of lawless ambition redeemed only by bravery was completed

THE TRAGEDY OF KING LEAR

LONG ago there was a King of Britain whose name was Lear. He was over eighty years old at the time of the story. Old and worn with the cares of his kingdom he decided that the time had come to give up his crown and his possessions, and spend his few remaining years in peace.

But King Lear had no son to succeed him ; he had only three daughters. The eldest of these was Goneril, wife of the Duke of Albany ; the second was named Regan, who was married to the Duke of Cornwall ; and the youngest and most beautiful, Cordelia, was still unmarried. Between his three daughters the aged King determined to divide his kingdom, so he called them together to tell them of his purpose, saying that he would give the largest share to the one that loved him most.

Goneril, a selfish, cold-hearted woman, pretended that she loved him more than her eyesight, grace, health, beauty, honour, even more than life itself. Regan, who was like her elder sister in character, protested that even the extravagant declaration of Goneril's love for her father was not strong enough for her. All her joy, she said, was in finding favour with her father.

Carried away by the loving words of these two false, selfish women, the old King gave each a third of his kingdom ; but when the kind-hearted Cordelia, who did truly love her father, would not exaggerate the terms of her love beyond those which a dutiful daughter should employ, Lear was enraged at her, and gave her nothing, dividing her share of his kingdom between her two sisters.

Cordelia, however, was not without consolation, as the King of France, who loved her for her sweet and gentle nature, made her his Queen. So insensible to reason had the old King grown, that the faithful Earl of Kent was banished

because he had ventured to plead with Lear on behalf of Cordelia. The kingdom of Britain was now divided between Goneril and Regan, whose husbands, the Duke of Albany and the Duke of Cornwall, thus shared the power of the old ruler. Lear fondly hoped to spend his days between the homes of his two children, attended by a retinue of one hundred followers. But he had not been long in Goneril's palace before he discovered that her love for him was all a sham. His daughter did everything she could to make his life unhappy, so that he was forced to leave with all his followers.

He went to the castle of the Earl of Gloucester, an old friend of his, who had acted in regard to his own two sons almost as foolishly as Lear had done to his own daughters. Gloucester's son Edmund, an evil-minded, selfish, and unscrupulous man, was his favourite, while, Edgar, his proper heir, a brave and honest son, had unjustly been forced by Edmund's scheming to leave the home of his father.

At Gloucester's castle more sorrow was in store for Lear, as there he met his daughter Regan, who had come to plan with Edmund how she might escape the nuisance of her father and his followers. Goneril herself came to the castle, and the two daughters did all they could to make the poor old King unhappy, declaring finally that he needed no servants at all.

Utterly broken-hearted, Lear now wandered away, accompanied only by his jester but followed soon after by the faithful Earl of Kent, who had disguised himself in order to be of service to his old King. On a wild and lonely heath, and in the midst of a great storm, they came upon a hovel inhabited by one who seemed to be a madman, but was really Edgar, the banished son of Gloucester, who was feigning madness.

Now, the Earl of Gloucester would gladly have stood by Lear in his trouble, though he had been warned against rendering him assistance. Gloucester, however, told his false son Edmund that he meant to help King Lear in secret, and also showed him a letter, just received, which brought the news that a French army was coming to attack the British. Here was Edmund's chance. He bore the letter to the Duke of Cornwall, and also told him of his father's intentions to succour the unhappy King. For this service his father's earldom was given to Edmund.

THE RETRIBUTION THAT CAME TO THE BRUTAL DUKE OF CORNWALL

In the meantime Gloucester had housed in a farm near his castle, not only Lear and the jester, but Kent and his own son Edgar, both of whom were of course disguised. He then had the King sent on to Dover, where the warriors of the country were gathering to meet the French, with whom was Cordelia.

The Duke of Cornwall was quickly on the track of Gloucester, whom he had arrested, and in his anger at the earl's efforts to save the King he blinded him, but was mortally wounded himself by one of his own followers, enraged at his cowardly brutality.

The tragedy was reaching its height, for the sightless earl was now led to Dover by none other than his own son, Edgar; and, nearing the town, he came upon King Lear, gone out of his mind, fantastically decked with flowers. A follower of Goneril, meeting them, sought to kill the Earl of Gloucester, but Edgar fought and slew the man, and discovered that he was the bearer of a love-letter from the faithless Goneril to his own step-brother Edmund.

THE HAPPY REUNION OF LEAR AND HIS DAUGHTER CORDELIA

Lear was now brought to the French camp at Dover, where his daughter Cordelia, who had never ceased to love her father, received him tenderly and tried to console him, when they were made prisoners by the victorious British.

Lear now wants only Cordelia, and when she proposes they shall see her sisters, he refuses her request.

No, no, no, no! Come, let's away to prison;
We two alone will sing like birds in the cage:
When thou dost ask me blessing, I'll kneel down,
And ask of thee forgiveness; so we'll live,

And pray, and sing, and tell old tales, and laugh
At gilded butterflies, and hear poor rogues
Talk of court news; and we'll talk with them
too,

Who loses and who wins; who's in, who's out;
And take upon us the mystery of things,
As if we were God's spies; and we'll wear out,
In a walled prison, packs and sets of great ones
That ebb and flow by the moon.

But the war between France and Britain was not so fierce as that which now raged between Goneril and Regan. These two faithless sisters had both fallen in love with the villain Edmund. When Edgar gave Goneril's letter to the Duke of Albany, the duke challenged Edmund to a duel, just after the battle had been fought in which King Lear and Cordelia had been taken prisoners.

THE SAD NOTE ON WHICH THE GREAT TRAGEDY ENDS

Edmund was fatally wounded by the duke; but meanwhile the two unhappy women who had been the cause of all this sad tragedy had settled matters in a drastic way. Goneril had contrived to poison her sister Regan, out of jealousy at her love for Edmund, and she, when her own guilty secret was laid bare by the discovery of her love-letter, stabbed herself and died.

All too late, Edmund, now dying of his wounds, and repenting of his evil conduct, asked that the life of Cordelia might be spared; but, at the very moment when he was breathing his last, the weird figure of the old King carrying the dead body of Cordelia appeared. She had been strangled in prison. The last blow in the great tragedy had been struck.

The Duke of Albany, who had always been friendly to King Lear, despite the evil influence of his wife, would now have had the aged King resume his power, but that was hopeless; his heart was broken and death was on him.

Vex not his ghost: O! let him pass; he hates him
That would upon the rack of this tough world
Stretch him out longer.

In these immortal lines Kent takes farewell of the master he had served so loyally through good and evil fortune. Lear had made shipwreck of his hopes, but at the last, pity for his sufferings silenced criticism.

The duke, however, showed his feeling for Lear by rewarding both Edgar and Kent for the services they had rendered to the poor old King in his hour of need.

The Story of the Most Beautiful Book in the World



The Apostles go out into the world to preach

THE VISION OF PETER

HAVE we ever thought how strange a thing it is that after the ignominious death of Jesus, the son of a carpenter in a despised village, his religion, which he had left in the hands of eleven uneducated men, who had all forsaken Him and fled in the hour of his downfall, should have spread, in the lifetime of those very men, to nations and countries far away from Jerusalem?

This is the most wonderful fact of human history. We cannot exaggerate its wonder. Nothing in the least resembling it had ever occurred before or has occurred since. It stands out in the history of humanity as an event that it is impossible to deny, and equally impossible to explain on purely human grounds.

Imagine that a carpenter's son from a village in Essex appeared in London with twelve labourers and fishermen, preaching a new religion and prophesying the downfall of Christianity. Imagine that the twelve labourers and fishermen were not very loyal to their leader, that they rather doubted the truth of what he said, and that as soon as the police stepped in and arrested him they all deserted him.

Imagine that the archbishops and bishops proved by law that this innocent preacher should be put to death, and that he was

hanged like a murderer. What should we say if we found that after his death the labourers and fishermen who had followed him, and who had deserted him, spread the knowledge of his life and work throughout Europe, converting Frenchmen and Germans, Japanese, and Turks, from their religion, and filling the whole world with his name? What should we say to such an extraordinary event as that?

That would be wonderful enough, but it would not equal the wonder of Christianity. For the Gospel of Christianity, which is nothing more or less than the Character of Christ, spread among the nations before there was printing, before there was a railway or a telegraph, and before civilisation had reached a gentleness and kindness which, owing to Christ Himself, is now the characteristic of social life. It was a triumph of sweetness, beauty, and humility, at a time when blood was on the hands of rulers and princes, and when mankind was degraded by sin.

We can see how this revolution took place by following the narrative of Paul's life; but we must leave him for the present at his home in Tarsus while we read about a striking incident in the life of Peter, the consequences of which have impressed themselves upon the ages.

The persecutions inflicted by Paul had driven many devout Nazarenes from Jerusalem. Rather than give up their faith in Jesus, they fled to distant towns and there began life afresh. In the seaside town of Joppa there was a community of these Nazarenes, and Peter went on a visit to them. He stayed in the house of one Simon, who was a tanner, and we can see how very humble must have been the beginning of Christianity for the head of the brotherhood to stay in the house of a man following a trade which was detested by the Jews. There were special Jewish laws against tanners. One Rabbi says: "The world cannot exist without tanners, but woe unto him who is a tanner." The fact that they handled animal hides rendered them vile in the eyes of strict Jews.

THE FEEBLE BIRTH OF THE MIGHTIEST MOVEMENT IN THE WORLD

If Peter had no better house open to him in the fine city of Joppa than this miserable dwelling of Simon the tanner, the religion of the Nazarenes must indeed have been in a feeble condition.

And so, indeed, it was. The followers of Jesus still believed that His revelation was particularly, if not wholly, for the Jews; they felt the same contempt for foreigners as the rest of their race; they hoped to see the ideas of Jesus adopted in the ordinary Jewish worship.

One or two converts had realised a greater truth. Stephen, the first martyr, and the cultured Philip, had been sought to bring foreigners into the brotherhood of Jesus. But the apostles held back. In any case every converted foreigner had to become a Jew, a disciple of the Mosaic law. Peter now and then seems to have had some idea of a wider field for Christ's Gospel; but he was certainly not a missionary to the foreigners. Therefore we see that the religion of Jesus at the outset was nothing but a very small and insignificant Jewish sect; a sect which had to be secret because of its powerful enemies.

THE STRANGE VISION THAT CAME TO PETER

One day, in the house of Simon the tanner, Peter rose and mounted to the roof, like a pious Jew, to say his mid-day prayer. From the flat roof of this Eastern house he saw the blue sea creeping over the bleached sands, and felt the heat of the noonday sun beating down upon him. As he prayed he became hungry, and, probably exhausted by his hard life,

his scant fare, and the pitiless glare beating up from the hot, white roof into his eyes, he fell into a swoon.

In this trance he saw an immense movement in the sky, as if it were a gigantic linen sheet being lowered by ropes at the four corners, and saw within it all manner of birds, fowls, and reptiles. "Rise, Peter," said a Voice within him; "kill, and eat." Hungered and exhausted as he was, the Jew in him cried out: "Not so, Lord!" for among these creatures there were those which the law of Moses forbade all Jews to eat.

It was because the Jews were so strict about their diet, and because they would not eat certain animals, such as swine—which they never even mentioned by name—that they looked with loathing and contempt on other nations. "Not so, Lord; for I have never eaten any thing that is common or unclean."

The Voice answered, "What God hath cleansed, that call not thou common."

The rebuke came three times, the vision vanished, and Peter woke out of the trance into which he had fallen.

THE RICH CENTURION WHO SENT FOR THE HUMBLE FISHERMAN

Clear as the brilliant sun to which he woke was the meaning of this vision; but, as his eyes were dazzled by the light, so was his soul too dazed to realise in all its wonderful fullness the meaning of his vision. He was pondering it in his heart when he heard the voices of three foreigners in the street below, inquiring for him at the door of Simon's house. One of these men was a soldier.

He went down and asked what they wanted. They told him that Cornelius, the centurion of Caesarea, desired that he should come to him on a visit.

At once the full meaning of the vision flashed upon his mind. Cornelius was a foreigner, a man of power, a good man, respected, even by the Jews. Peter realised that God had moved the heart of this great man towards Jesus of Nazareth. He saw how important a thing had happened, and on his journey to Caesarea he took with him six of the Nazarenes at Joppa to witness what should follow.

The scene was a striking one. Cornelius, whose imagination had been kindled by stories of Jesus, was waiting in his house with several friends and kinsmen for the humble apostle. As soon as he

THE VISION OF PETER

saw him he went forward and bowed his knee to the fisherman.

"Stand up," said Peter; "I myself also am a man." That was finely said. They went in together and talked, and Peter said: "Ye know how that it is an unlawful thing for a man that is a Jew to come unto one of another nation; but God hath shewed me that I should not call any man common or unclean." Cornelius related that a vision had bid him send for Peter, and he concluded by asking the apostle to speak what God commanded him. Then Peter uttered these remarkable words:

"Of truth I perceive that God is no respecter of person; but in every nation he that feareth Him, and worketh righteousness, is accepted with Him." Having spoken these words, he told the story of Jesus, and showed that it was to this Jesus of Nazareth that all the prophets had pointed through the ages.

His words made a great affect. The Nazarenes who were with him felt the power of the Holy Spirit afresh, and saw in those

about them the same transfiguring effect. Peter, witnessing the descent of the Spirit upon these foreigners, cried out: "Can any man forbid water, that these should not be baptised?" And he baptised them all into the religion of Jesus.

How was this great event received by the Nazarenes in Jerusalem? When Peter returned he was met with a complaint. The brethren gathered there blamed Peter bitterly for having associated with the Gentiles, for eating with them, and for admitting them to the brotherhood.

But Peter related the exact details of his vision and what happened afterwards, and they "held their peace, and glorified God, saying, Then hath God also to

the Gentiles granted repentance unto life."

Dean Farrar brings vividly home to us the horror that a true Jew would feel at such acts as Peter's. "To associate with them," he says, "to enter their houses, was not that pollution enough? To touch in familiar intercourse men who had never received the seal of the covenant—was not that sufficiently horrible? But to *eat with them*—to eat food prepared by Gentiles; to taste meat which had been illegally killed by Gentile hands; to take food from dishes which any sort of

unclean insect or animal might have defiled—was it to be thought of without a shudder?"

Truly, to the Jew it was a fearful thing that Peter had done. He had defied the law of Moses.

Now do we see how poor and insignificant was the state of the brotherhood immediately after the resurrection of Jesus? What was it but a little frightened, secret faction of the Jews, paying far more attention to the Jewish religion than to the grand and il-



PETER

luminating words of Jesus?

But Peter had taken a step destined to change the history of the world. By crossing the threshold of the Roman's house in Caesarea he really carried Christianity from Asia to Europe; by sitting down to meat with this foreigner he transplanted Christianity from Judaism to the hearts of all people. The great miracle had begun. Christianity was rescued from its peril of becoming a narrow sectarian creed and founded firmly as a religion for all mankind.

And yet only grudgingly did the Nazarenes in Jerusalem accept the new conditions. We must look from Peter to Paul, and from Jerusalem to Antioch, for the development of this revolution.

WHAT IS WRONG WITH THIS STEAMER?



When we visit the docks or stand on a busy wharf at a large seaside town, we often gaze at the great ships that bring us wheat and timber and the wealth of the world, for use in all parts of the country. Here is a picture of one of these great steamers. In making his drawing the artist has made at least ten mistakes. A list of them appears in Section 51 of Group 18.

The Interests and Pleasures of Life for All Indoors and Out



HOCKEY FOR BOYS AND GIRLS

HOCKEY is a splendid winter game for both boys and girls. It is played on a ground marked out as seen in the diagram, although the field may be much smaller than that shown. The game lasts about seventy minutes, the players changing over at half-time.

In the centre of each goal-line stands the goal. In front of each goal is a "striking circle" and no goal can be scored unless the ball is hit through the posts from inside this circle. The lines themselves count as part of the striking circle.

A hockey-ball is like a cricket-ball and is painted white, or made of white leather. A hockey-stick must be made of wood, and must have a flat surface on its left side only, and must not weigh more than 28 ounces.

For a match each team consists of eleven players. The object of the game is to put the ball through our opponents' goal as often as possible, and to prevent them from scoring. A team is generally divided into five forwards, three half-backs, two backs, and a goalkeeper.

The forwards must be swift runners, able to dribble and dodge and shoot, and to hit a ball from a pass without first stopping it dead. The half-backs must help the attack by constantly feeding their forwards with the ball.

The backs must be strong and plucky players, able to hit hard and straight, to stop hard hits and tackle rushes.

The goalkeeper is the last line of defence; his duty is to prevent the ball from passing between the posts, and to send it away from the neighbourhood of the goal. He may kick

the ball when he is inside his own striking circle. If there is no goalkeeper, one other player may be chosen who will have the right to kick the ball.

The game is started by the two rival centre-forwards "bullying off" in the middle of the centre-line, while the rest of the players must stand in position, as shown in the diagram. To bully off, each of the two centre-forwards, both standing squarely opposite each other and facing the side-lines, must first strike the ground on his own side of the ball, and then his opponent's stick over the ball, three times alternately. Either may then strike the ball independently, thus putting it into play. This central bully also takes place after half-time and whenever a goal has been scored. A goal is scored when the ball passes entirely over the part of the goal-line between the posts, after being hit by, or having glanced off, the stick of an attacker who is inside the striking circle.

We may stop the ball when it is in play, but must immediately let it fall straight down to the ground. We may also stop it dead with the feet or with any part of the body. It is against the rules to raise any part of the stick above the shoulder while striking the ball, to touch the ball with the back of the stick, or to fence or hook sticks with any opponent who is not within striking distance of the ball, or to strike or hook an opponent's person; to charge, kick, collar, or trip up an opponent; to obstruct an opponent by running between him and the ball, or to touch him when running across

CRAFTS · GAMES · NEEDLEWORK · PUZZLES · SCIENCE EXPERIMENTS

THINGS TO MAKE & DO

him from the left, unless we touch the ball first; to pick up, carry, or kick the ball. The following are the penalties for breaking any of the above rules.

If the offence is committed by either side outside the striking circle, or by the attacking side within their opponents' striking circle, a "free hit" is given. While this is being taken, none of the offender's side is allowed within five yards of the ball, and the player who takes the free hit may not play the ball again until it has been touched by another player; if he does, a free hit is given to the other side. If the offence is committed by the defending side within their own striking circle, a penalty corner is given. Flagrant breach of the rules in the circle is punished with a penalty bully. If the rules for the penalty bully are broken, the penalty bully is taken over again.

When a player sends the ball right over the side-line, it must be "rolled in" by one of the opposite side. The "roller-in" must stand at the point where the ball crossed the side-line, and, with his stick and both feet outside the line, roll the ball in any direction along the ground, otherwise it is a "foul throw." The moment the ball leaves the hand it is in play, but until then all other players must stand at least five yards from the side-line.

When a player of one team is "rolling in" or hitting the ball, any player of the same team who is at that moment nearer the opponents' goal-line than the striker or roller-in is off-side, if there are not at least three opponents nearer their own goal than he is. But we cannot be off-side in our own half of the ground.

If the ball is unintentionally sent behind the goal-line by one of the defending team who is within the 25-yards line, the umpire

must give a "corner" hit to the attacking team; if the ball is deliberately hit behind the line by a defender in the circle a penalty corner is given.

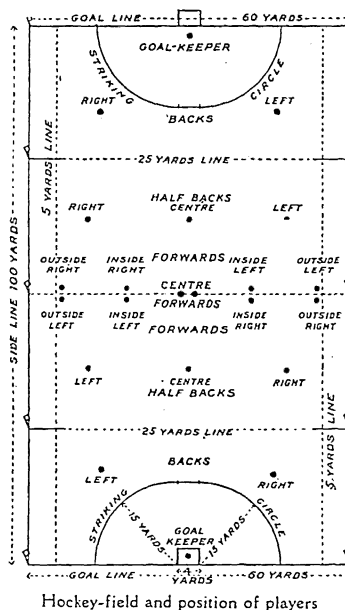
For an ordinary corner all the members of the defending team must stand behind their own goal-line; the attacking team stand outside the striking circle in the field of play. One of the attacking team then takes a hit from any point on the goal-line or side-line within three yards of the nearest corner flag.

No player may stand within five yards of the striker while the corner hit is being taken, and no goal can be scored from a corner hit unless the ball has first either been stopped by an attacker, or touched the stick or the person of one of the defending side. The player who takes the corner hit cannot touch the ball again until it has been hit by another player. When a penalty corner has been awarded, one of the attacking team takes a hit from any part of the goal-line not less than ten yards from the nearest goal-post. All other players stand as for an ordinary corner.

A penalty bully is played on the spot where the rule was broken, by the player who has broken the rule and some member of the opposing team. All other players must keep beyond the nearer 25-

yards line in the field of play.

If during a penalty bully either player sends the ball over the goal-line between the posts, it counts a goal to the attackers. If the offender sends the ball behind any part of his own goal-line outside the goal-posts, the bully must be taken again. If either player sends the ball outside the striking circle, the game is restarted by an ordinary bully on the centre of the nearest 25-yards line; the same is also done if, in the penalty bully, the attacker happens to send the ball over the goal-line outside the goal-posts



Hockey-field and position of players

A PENKNIFE AS COMPASSES

WE may want to draw circles of various sizes when there are no compasses handy, but if we have a penknife we can easily turn it into a pair of compasses.

All we have to do is to open the two blades of the penknife, one at each end, fix the point of the small blade into a piece of black lead pencil, and then, using the long blade as a centre, operate the knife in the same way as an ordinary pair of compasses. The blades can be opened or closed to any angle so as to make circles of greater or less diameter.

One or two things have to be remembered in order to ensure success with the penknife

compasses. It is, of course, important that the blades should not be loose in the handle. Then the knife must not be too new, so that the springs work with great force and snap up at the least touch; in that case, we could not, of course, regulate the size of our circles as required.

Also the pencil, which must not be too long, must be fixed firmly to the small blade so as to allow of no wobbling when the circles are being drawn. If the knife is sharp we must be careful not to cut ourselves when fastening on the pencil and regulating the angles of the blades.

HOW TO FIND OUR WAY IN A FOREST

MOST of us at some time or other during our holiday rambles have been lost in a forest or wood. Perhaps it is raining hard, and we are hurrying for shelter, or we want to catch a train, and, in an endeavour to save time, have left the pathway. Then it is, that, unless we happen to have a compass, or know how to read Nature's signposts, we may wander about aimlessly for hours.

But we need not be lost in the wood, for Nature has supplied us with an unfailing series of signs, which, if known and studied, show us the north, south, east, and west as clearly and truly as any compass.

Find a full-grown tree that stands slightly apart from its fellows. Now look carefully at the bark. It will be harder, lighter, and drier on the south side; while on the north side it will be considerably darker in tone, and often at the roots on the north side we shall find a clump of moss. Nearly all the hardwood trees, such as the oak, the ash, and the elm, have moss growing on the north side; while on that side the leaves are longer, of darker green, and have lighter veins than those found on the south side. Again, spiders build on the south side, and cedars bend their tips to the south.

One of the surest ways of discovering the compass points is to find a sawn or cut stump. The rings of wood seen in the section will be found to be thicker on the south side than on the north, so that the heart of the stump is nearer the north side. All these signs are given to us by the effects of the Sun. Stones that have rested in the same spot for some time usually have moss on the side facing north, while at best on the south side we shall find only a thin covering of harsh, half-dried moss. On the north side of a hill, ferns, mosses, and late flowers grow, and this side is at all times greener with vegetation. In winter nests of insects will be found in the crevices on the south side of trees with rough bark.

If we are on a marsh small bushes will act as compasses, their leaves and limbs showing the same differences as we have seen on the trees in the wood. If we are fortunate enough to catch sight of a telegraph pole when we have missed our way, it is worth while to remember that the crosspieces of wood that carry the wires are always fixed on the side of the pole nearest London. But this is only useful when we know the direction of London in relation to the other place.

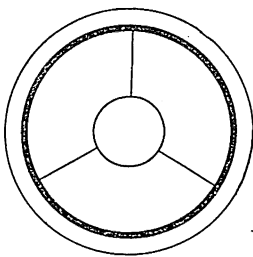
THE WHIRLING KALEIDOSCOPE

HERE is an interesting scientific toy that can be made by any boy or girl.

We take a pair of compasses, and on a piece of stiff, white cardboard draw the figure shown here, making it about three or four inches in diameter. Then we cut out the disc with a sharp penknife, and cut a round hole in the centre, following the circumference of the inner circle. If the toy is to work properly there must be no jagged edges, hence the importance of using a very sharp penknife.

The next thing is to paint the disc. Leave the outer circle white, but colour the three inside divisions, making one bright red or crimson lake, the next one ultramarine or Prussian blue, and the third gamboge or chrome yellow. These are the usual colours we find in any boy's paint box. Be sure to get the colours bright, but not too dark.

As soon as the disc is dry it is ready for use. To obtain a succession of colour changes pass a piece of flexible string through the central hole, and, holding one end firmly in each hand, turn the string once or twice rapidly and then pull taut.



The disc will have been set revolving by the turning of the string, and when that is pulled tight the disc will continue revolving rapidly on it. As it does so the colours will blend, and as different parts of the interior circumference touch the string in turn, the combinations of colour will vary wonderfully.

While the disc gives pleasure as a toy, it is also of considerable scientific interest and value, and we should know the reason for the curious changes.

Owing to the rapid revolving of the disc, our eyes are unable to follow the individual colours as they go round, and so they become merged. Blue, yellow, and red mix in various ways, giving all the colours of the rainbow.

The reason why the positions of the colours keep changing as we

spin the disc on the string is that the colour which touches the string is always in the centre, and revolves less rapidly than the other colours, being nearer the axis on which the card turns.

It is necessary to keep the narrow white border round the outside of the disc in order to frame the colours.

ANSWERS TO THE PUZZLE GAME ON PAGE 6058

ON page 6058 appears a natural history puzzle game in which seven well-known things are described. These are the names

of the various articles referred to: 1. The common sweet chestnut; 2. Herrings; 3. Tea; 4. Silk; 5. Oats; 6. Honey; 7. Apples.

WHAT TO DO IN CASE OF ACCIDENT

ACCIDENTS will happen, and it is just as well that we should know what to do while we are waiting for the doctor to come. We can often prevent much suffering, and perhaps save a life, by carrying out the simple rules that are set out on this page, and we must remember to act promptly and calmly, and, in most cases, see that the injured person has a thoroughly good supply of fresh air all the time.

TO TREAT A BROKEN LIMB

There are many things that would serve as temporary splints in cases where a limb has been broken, and perhaps those most easily obtainable are walking-sticks or umbrellas. The splint may be bound on by a handkerchief, necktie, or even a belt. Failing a splint, an injured leg may be bandaged to the other one, or an arm bandaged to the body.

A handkerchief should be folded diagonally, and passed round and round the limb and splint, then tied outside the splint. Or the bandage may be folded lengthways, and placed across the splint. Then the ends should be carried round the limb and splint, and one of them must be passed through the loop made by the fold, and tied to the other end. It is important that the limb should be moved as little as possible until a qualified medical man has attended to the break.

TREATMENT OF BURNS AND SCALDS

A burn is caused by dry heat, a scald by moist heat, usually boiling water. When the injured part is covered with clothing the clothing must be carefully removed, and if it adheres to the skin it should be cut away from around the injured part. Air is to be rigidly excluded; this is effected in the case of a slight injury by dusting the surface with flour or a pure powder such as whiting, and tying or bandaging cotton-wool or a piece of flannel over it.

A bad burn that has caused blisters must be covered with strips of soft linen or lint dipped in olive oil, linseed oil, or carron oil, or the lint may be smeared with vaseline or lanoline; should none of these things be available, unsalted butter or the raw white of a good egg may be used. A scalded foot should be placed in warm water, not too hot, till the dressings are ready. The body should be kept comfortably warm, and a warm drink is a good thing to give to the sufferer.

TO RESTORE THE HALF-DROWNED

We must loosen the clothing, and wipe the mouth inside and out to free the air-passages from froth and water. Then we lay the patient face downward, raising the chest with a pad, and resting the forehead on the right arm. We press our hands on the back over the lower ribs for three seconds, then we turn the body over and repeat the pressure. We do this alternately till the lung-passages are quite clear.

The following is the Sylvester method of treatment. The person is placed on his

back, with a pad under the shoulders, the tongue is held out or secured with a handkerchief or band, while someone behind the head grasps the elbows and carries them from the sides upwards and down over the head to induce inspiration; then back again down to the sides to induce expiration.

These movements are repeated fifteen times a minute till the patient begins to breathe naturally. We must wrap him in blankets and use hot-water bottles to restore the circulation of his blood. It is essential that we should get him off to bed as soon as possible.

TO STOP CUTS FROM BLEEDING

If we cut ourselves the blood may come from the wound in a steady flow or in bright red spurts. In the latter case an artery is cut, and a thumb must be pressed above the cut, between it and the heart, until a pad, such as a cork, stone, or some other small object, can be tied tightly in its place. Everyone should know the position of the chief arteries of the body, for a few minutes' blundering may cost a life.

In case of a cut vein, we should apply a pad and bandage to the wound, on the side away from the heart. A dirty flesh-wound should either be washed, or, if no water is obtainable, wiped with a clean handkerchief, and bandaged with another handkerchief.

It is better to cover the wound with a piece of blank white paper, such as notepaper, rather than let a soiled handkerchief touch it. The edges of a clean cut should be pressed together, and covered with antiseptic rubber plaster. A wound should be washed, whenever possible, in luke-warm water, cleansed properly with an antiseptic, then covered with lint, and finally bandaged.

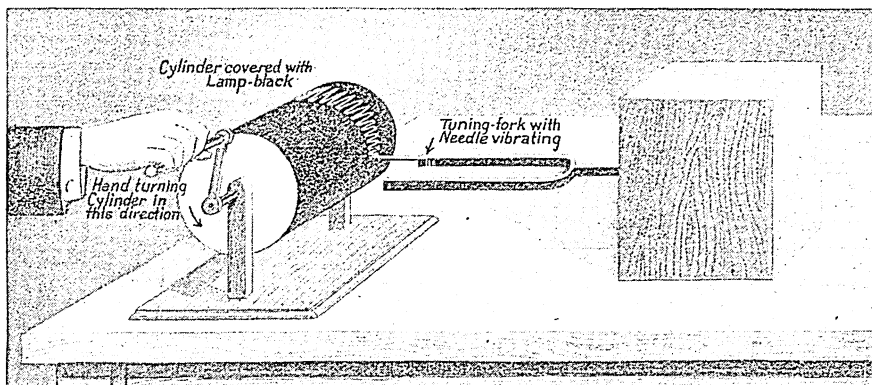
TO TREAT CASES OF POISONING

Each poison has an antidote, and if a person has taken a corrosive poison, which causes burning pains and discolours the lips and mouth, we should at once make him drink something acid, such as vinegar or lemon-juice.

If the person has not taken a corrosive poison, we should force him to drink something that will make him sick. A tablespoonful of salt or a dessertspoonful of mustard in a glass of warm water may do this, or we may even try tickling the throat with a feather or thrusting a finger down it. Milk, eggs beaten up in milk, olive oil, or linseed oil are very helpful; but no oil should be given in cases of phosphorous poisoning. On no account must we let the person go to sleep, and a good strong cup of tea or coffee would help a great deal in keeping him awake.

By following simple directions such as these serious consequences may be avoided, and in every case the patient is saved from much suffering. The great need is for us to be ready in all emergencies to do whatever may be the right thing for the occasion.

The Story of the Boundless Universe and All Its Wondrous Worlds



If a needle is attached to a tuning-fork, and the fork is fixed in a block of wood and then struck, the vibrating needle will draw a wavy line on a slowly revolving cylinder

MUSIC AND NOISE

WE know that sound waves agree in many ways with other kinds of waves, like the waves of the sea, or the waves of light. We must now go on to study the nature of these sound waves; and the first thing we discover is that they differ from other waves in one highly important respect.

In the sea the wave runs along the surface, but the movements of the water, which make the wave, are not at all along the surface of the sea; they are up-and-down movements. Of course, it looks to our eyes as if the water were really running along, but it is not; the wave is running along; the water itself is only rising and falling.

The proper way of saying this is that the vibration is at right angles to (or away from) the line of the wave. The wave is moving along in one direction, and the particles of water which make the wave are moving at right angles to that direction. They are moving, not along, but up and down. The movement might just as well be from side to side, but in any case it is a *transverse* vibration—that is to say, a vibration across. Now, what we have learned about the waves of the sea is true of the waves of light; but it is not true of sound waves. The great point about

sound waves, is that the movement of the air, or whatever the medium happens to be, is not at right angles to the path of the wave, but is a movement to and fro in the line of the wave. Let us think of a stretched string that is vibrating and imagine it is giving a little series of blows to the air that is next to it; or let us think of a fist moving backwards and forwards in the air, making a number of quick taps.

That is the way a sound wave is started. When the air is tapped it is squeezed, but it is elastic, and in between the taps it springs back, and so it is alternately condensed and expanded, and the wave is made up of these to-and-fro movements of the particles of air in the line of the wave.

It is really not difficult to form in our minds an accurate picture of the way in which the wave travels. All we need do is to place on a table a row of billiard balls, all touching one another. Suppose we now roll another billiard ball against the ball at one end of the row. Each ball in turn is squeezed, and passes the pressure on to the next one, with the result that the ball at the other end of the row is shot out by itself. Each ball in turn is pressed and relaxed. That is what happens to the air when a sound wave travels through it, and we may imagine that the wave is

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made to travel by particles of air bumping against each other in their to-and-fro movement, as the billiard balls bump each against the next.

That is all we need know about the nature of sound waves, but the next question we may naturally ask is: What makes the difference between the sounds we call noises and those we call musical notes? Or, in the case of a modern piece of music full of discords, what marks the line between music on the one hand, and din on the other hand?

Well, the case of music teaches us that there is no sharp and absolute line to be drawn between noise and music, as there are many sounds and combinations of sounds which are pleasant and musical to one ear and unpleasant to another. Nevertheless, though there is room for difference of opinion at the margin between the two kinds of sounds, we can answer without hesitation that the difference between what everyone would call a noise and what everyone would call music, depends on whether the waves making the sound are regular or irregular.

THE SHAPE OF THE MUSICAL SOUNDS OF AN ORCHESTRA

When we take a rich and complicated musical sound made by a large orchestra, the resulting wave is regular and yet irregular. The ear of a child, or any untrained ear, may not perceive the regularity, and to such an ear the sound may be a noise; but the ear of a musician may perceive that the sound really is regular, and has a definite shape, and to him it may be a splendid musical experience. Also, there may be room in music sometimes for sounds which are partly regular, and therefore musical, and partly irregular, and therefore noise. Certain of the metal and drum-like instruments which are struck in the modern orchestra owe their value to this mixture of noise and music.

We do not really know why waves which strike the ear in a regular way should be called pleasant and why those which are irregular should be called unpleasant; but it seems natural that a regular, even steady flow of impulses into the hearing part of the brain should be pleasant, and we can imagine why it should be unpleasant for the nerve cells to be disturbed by waves without order or rhythm, all mixed up together, and perhaps liable to throw out of order the living

machinery of the cells. Perhaps we may fairly compare the difference between the effects of music and noise to the difference between rocking a baby and shaking it.

The most simple, but by no means the most interesting, difference between musical notes is in their loudness; and what has to be said about this is true equally of noises.

THE POWER OF THE EAR TO DISTINGUISH BETWEEN VARIOUS SOUNDS

Loudness of sound depends on the size of the waves that cause it. The proper word in this connection is not size, but *amplitude*. The greater the amplitude of the waves, the louder the sound. If sound waves were like water waves, then a very faint sound would correspond to a little ripple, and a very loud sound to waves "mountains high." There is something to be added to this, however, because, when we use such a word as loudness, it is evident that we have to reckon not only with what is outside the ear, but also with the ear itself. Now, it is the fact that if we take notes of various pitch, high and low, all having the same amplitude of waves, they do not sound equally loud. Thus, though it is true that the loudness of a given note depends on its amplitude, when we compare different notes we find that if the amplitude be all the same, the higher in pitch they are the louder they sound. In other words, our ears are more sensitive to high notes than to low notes.

From the point of view of music this is extremely important. It means that when we are listening to voices singing together or to something played on the piano, our ears always give more value to the higher notes than to the lower ones.

WHY HIGH NOTES ARE ALWAYS HEARD BETTER THAN LOW NOTES

The basses, the tenors, and the contraltos, for instance, may be making as much sound as the sopranos, but, our ears being more sensitive to high tones, we hear the sopranos best. That is why the sopranos are usually given what we call the tune to sing, while the basses, tenors, and contraltos are only given something which accompanies the tune.

So when we are playing the piano, if the tune is in the top notes of the right hand we can use both hands and all our fingers with equal force, and the tune will stand out clearly to the ear, because the ear is more sensitive to high tones. But

sometimes a piece is written with the tune for the left hand, and the accompaniment for the right hand. In such a case, if both hands play with equal force we shall not hear the tune properly, but shall mainly hear a meaningless accompaniment. The player, therefore, must in such a case play lightly with his right hand, and pick the notes out strongly with his left hand, so as to compensate for the fact that the ear is more sensitive to high than to low notes.

On the other hand, it is very interesting to observe that, so far as the startling, or fear-producing, effect is concerned, low notes are vastly more powerful than high ones. The sudden sound of a flute, even loudly sounded, and of course, being high-pitched, sharply heard by the ear, has no startling quality at all compared with a roll of distant thunder or any kind of sound that resembles a growl. It is very noticeable in babies and small children that a low-pitched voice may frighten them, even though it is heard far less intensely by the ear than a high-pitched voice would be.

HOW TO DRAW A PICTURE OF A SOUND ON A SHEET OF PAPER

So much for the loudness of sounds. Our next concern is with the pitch of musical tones; and it is easy to show that the difference between a high note and a low note lies in the difference between the number of waves that strike the ear in a given time. It is not difficult to prove this, because we can take a tuning-fork and set it vibrating, and make one of the prongs, or something attached to one of them, scratch a record of what happens on a piece of smoked paper, which we can move at a known rate close to the fork.

In this way we get an up-and-down line marked on the paper, and may actually count the number of vibrations made in each second by the particular fork. We then find that the greater the number of vibrations, the higher the pitch of the sound. Gradually the tuning-fork ceases to sound, and the note becomes fainter; but its pitch does not alter, however faint it is. If we look at the record made by the fork on the paper we can see the reason of this. The size of the waves steadily lessens as the fork loses its energy, and so the sound becomes fainter; but the number of waves in each second remains the same, however small they are, and that is why the pitch of the note is unaltered.

The best instrument for studying the pitch of musical sounds is called the siren. Siren was the name given to an imaginary kind of being, half woman and half bird, who sang so beautifully that no one could resist her; and it is by way of a joke that the name has been given to the modern siren, which produces notes that belong to the musical order but certainly could never charm anyone. The siren is simply an arrangement by which air is blown along a tube; but across the nozzle of the tube there is turning a flat piece of metal with a lot of holes in it, so that the air can only pass through when the holes come opposite the tube.

HOW THE SIREN IS MADE TO PRODUCE ITS SHRILL SOUND

If we know how many holes there are, and how often the disc spins in a second, we can tell the number of waves which are being produced to make the sound that we hear. If we begin very slowly there may be perhaps only ten holes coming opposite the tube in a second; that simply means ten puffs in a second.

It is true that we may hear each of these as a little puff; and we do so because each little puff starts something or other vibrating at a rate which we can hear. But the ten puffs in a second, taken together, do not make a sound for us. However, if the number reaches twelve or thirteen a few people will hear an extremely deep, low-pitched note, and people with ordinary, healthy ears should hear a low note when the puffs reach about sixteen a second. As we increase the number, the pitch of the note we hear rises until it becomes an intensely high whistle. There may be now thirty thousand puffs in each second, or more.

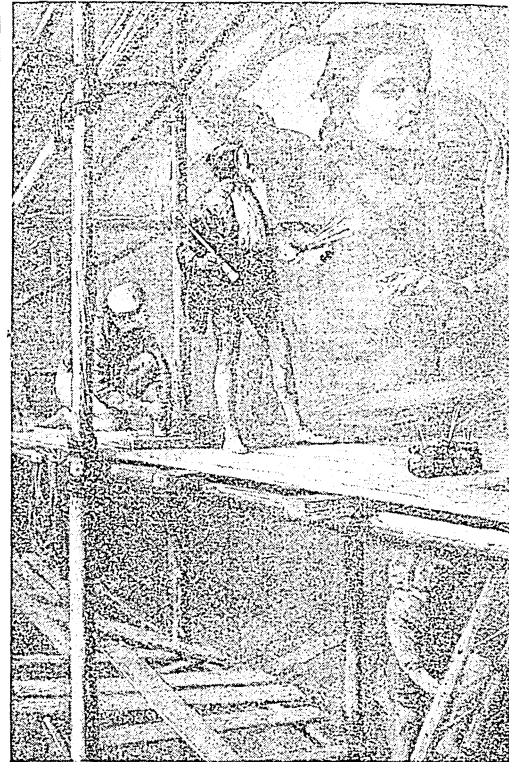
THE HIGH-PITCHED NOTES THAT LIONS AND CATS CAN HEAR

If a number of people are listening, especially people of different ages, it will be found that one after another ceases to hear anything at all, while others still hear an intensely high whistling note. As a rule, it is the elderly people who cannot hear these very high notes. More than a quarter of a century ago, Sir Francis Galton made some very interesting experiments on animals with a whistle producing extremely high-pitched notes, and he found that lions and cats were peculiarly sensitive to these notes, though other animals did not seem to be aware of them at all.

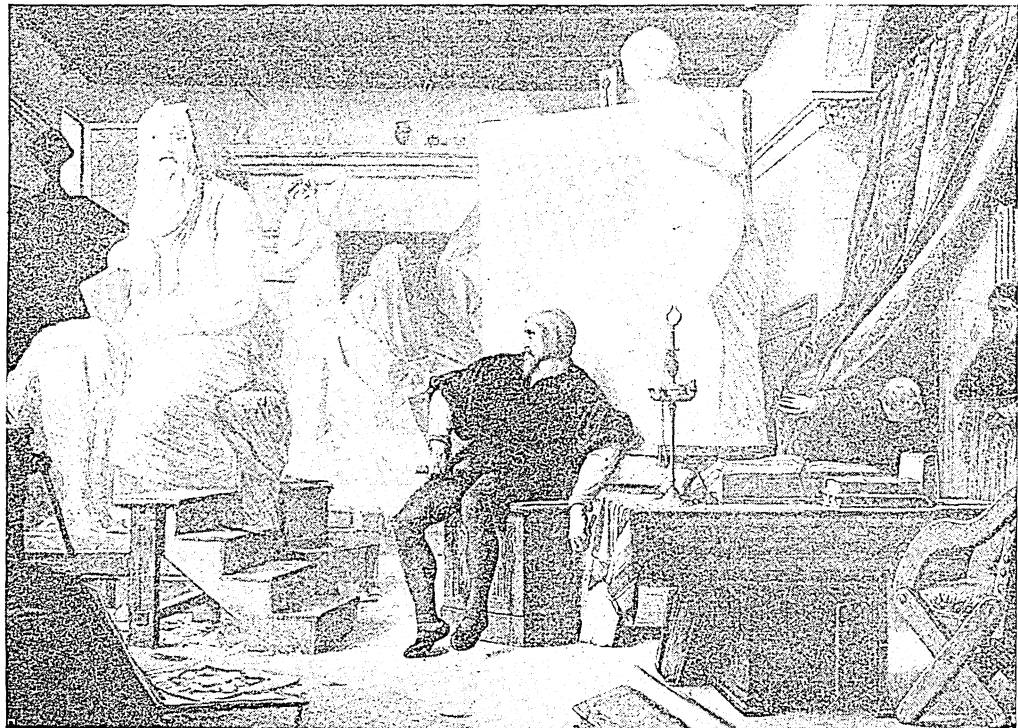
ITALY'S GREAT CRAFTSMAN



MICHAEL ANGELO AS HE STANDS OUTSIDE
THE UFFIZI PALACE IN FLORENCE



MICHAEL ANGELO WORKING ON HIS PICTURE
OF THE LAST JUDGMENT IN THE SISTINE CHAPEL



MICHAEL ANGELO CONTEMPLATES ONE OF HIS GREAT STATUES

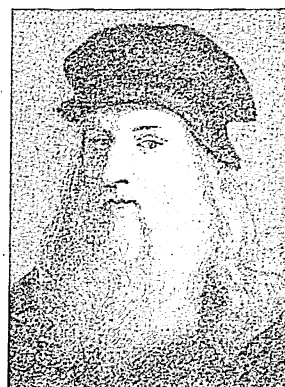
The Story of Immortal Folk Whose Work Will Never Die



Michael Angelo



Raphael



Leonardo da Vinci

THE MASTER MEN OF ITALY

MICHAEL ANGELO · LEONARDO · RAPHAEL

IN that great gallery of immortal men that Italy has given to mankind, a gallery unmatched in art by any other land, three stand out like giants: Michael Angelo, Leonardo da Vinci, and Raphael. In their lives we can see all the working out of ideals, the personal endeavour criss-crossed with fate, that makes such an ever-changing picture of Italy in the Great Years.

The century which held the lives of these three is the golden century of European art. What a wealth of genius lay in Italy then! How little men knew their good fortune when they could see Michael Angelo, Leonardo, and Raphael all together in Rome and in Florence, hear them speak, see them walk, and behold the mingled richness that their hands had wrought! Certainly these three great artists had plaudits enough from the people. But Italy was so used to genius that she simply took them as better than other artists, and she took artists as a matter of course. Now, in a world barren of such greatness, the lives of three supreme geniuses falling so near together seems a miracle.

Michael Angelo, the greatest of the three, was set by character and circum-

stance most apart. His real name was Michelangelo Buonarroti, and he was born in 1475 in the castle of Caprese, in the Arezzo Mountains, near Florence—near enough for the great Republic to claim him as her own. Florence was then at the height of her prosperity, and Michael Angelo marked the summit of her achievements in art. He lived to see her dragged down, humbled, her high estate and her pride sacrificed to the quarrels of her nobles and the political disturbances of Italy at that time.

His father, Ludovico, was a descendant of a noble Florentine family, and at the time of Michael Angelo's birth was Mayor of Caprese. When the boy was still young the father returned to Florence and left him with his nurse in the home of a stone-cutter of Settignano, near by. Michael Angelo never forgot the joy of those childhood years. "If there is anything good in me," he once said, "it comes from the pure air of your Arezzo hills."

The boy presently came to live with his parents in Florence, and was sent to school. His father seemed to grow poorer and poorer, and looked about for posts in commerce and in law for his sons. He wanted Michael Angelo, the eldest, to become a notary.

EXPLORERS · INVENTORS · WRITERS · ARTISTS · SCIENTISTS

But the boy's heart, as we may imagine, was not in his books. He was punished many times for his truancy and bad scholarship, to no effect. He still spent all the hours he could steal wandering about Florence, where the picturesqueness, colour, and grandeur of her Tuscan nobility and her rich traders combined to make a pageant of daily life.

THE ARTIST WHO RECOGNISED THE GENIUS OF MICHAEL ANGELO

One of the young Michael Angelo's best friends was an apprentice of Ghirlandajo, the painter. In the master's absence the boy spent many happy hours, and "played about" with pencil and paper to his heart's content. He also made many studies in secret, imitating the style of the painters he liked the best. One of these came under the eye of Ghirlandajo, and, recognising an unusual gift, he went himself to the boy's father and persuaded him to allow Michael Angelo to take up art instead of law.

Ludovico consented, and on the first day of April, 1488, his son, aged fourteen, became apprenticed to Ghirlandajo. It seemed almost from the first that no lessons were necessary. All that was needed to develop Michael Angelo's genius his new life gave to him—an unlimited chance of drawing. He soon outstripped the other apprentices; they could but stand and stare at his sketches wherein an almost uncanny knowledge of form revealed itself. One day he made a sketch of Ghirlandajo and some of the apprentices, and the master, seeing it by chance, exclaimed, "the boy knows more than I do."

LORENZO MEDICI AND WHAT HE DID FOR ART AND LEARNING

We can rarely think of a life like Michael Angelo's without remembering that fortune never comes with both hands full. This man of superb genius knew nothing of the art of living. He was bitter, moody, unfriendly, save to one or two, had few pleasant places in his life; it seemed that if he wandered into a green patch it was at once ploughed and salted with disappointment. He was always intolerant of all save what seemed to him the best, and his best was, even to himself, an inaccessible height whereto ceaselessly climbing he wore out his own spirit.

It is probable that Michael Angelo's happiest years fell in his boyhood. Before he had been in Ghirlandajo's studio a year he was noticed by Lorenzo Medici.

This Lorenzo the Magnificent, as he was called, deserves a special place in our regard. There is scarcely an artist of any merit of his time whom he did not freely help. His name is continually peeping out of records. Without him the world would have been incredibly poorer—though it must be said that a good deal of his "magnificence" was paid for out of public money.

Lorenzo took Michael Angelo into his own house, and there for two years the boy lived, one among the company of painters, scholars, and poets whom the Medici prince delighted to honour. There he gained his true education—absorbing the conversation of educated men. There he learned something of the art of making verse—for he wrote quite a number of sonnets of a certain merit during his life.

Unfortunately for Michael Angelo and many others, in 1492 Lorenzo died, and his son Piero became head of the house of Medici. Piero showed himself to be a very unworthy successor of Lorenzo. The pleasant company of intelligent and artistic people was scattered, and Michael Angelo returned to his father's house.

THE ONE THING THAT MATTERED IN THE LIFE OF MICHAEL ANGELO

A little later the artist was called to Rome by one of the Cardinals who had seen some of his work. For five years he stayed there, fulfilling orders first for one patron and then another. His life was austere, of a hardness we can scarcely comprehend. His hours of work were necessarily long, because, although he had by now pupils and assistants of his own, he never deputed to them the finishing of a piece of work, as so many artists of the day were content to do. He was merciless to himself, ate little, slept little, thought nothing of sharing his room with his helpers. All that mattered was his work.

Presently we hear of him in Florence again, and this time to some purpose. The authorities showed him a huge block of marble which some other artist had discarded. From this Michael Angelo fashioned his colossal David. Half Florence gathered to see this man flinging his mallet about, making the chips of marble fly, working in a fierce, apparently careless manner that held them speechless. The David made him famous; he found it difficult to cope with the commissions that came to him.

In 1505 a new power rose in his life. He was summoned to Rome by Pope Julius II.

THE MASTER MEN OF ITALY

This extraordinary man, who only "reigned" ten years, had an extraordinary effect on all Italy, and on her artists. He was at heart a soldier, but in addition to making Italy ring with the sound of his sword, he made Rome ring with the sound of artists' and builders' chisels. He called in Michael Angelo; two years later he summoned Raphael; he had Bramante rebuilding St. Peter's, and a number of other artists. He was not so much a kindly patron, like Lorenzo, as a master, and a most difficult master, as we shall presently see.

It seemed that for the rest of his life Michael Angelo was at the mercy of first one pope and then another, making plans at their orders which were changed before they could be fulfilled. The sheer waste of these years of his prime makes one of the saddest chapters in art's story.

First, Julius must have a gigantic monument made for his own tomb, embodying a great array of figures which should show his exploits. Nothing was too good for the sculptor who was to make the pope immortal. But the work was no sooner begun than his holiness lost interest. He even forgot to give the sculptor ordinary wages for daily needs. Poor Michael Angelo strode up to the pope's palace one day in desperation, and was rudely dismissed by a servant.

THE SHAMEFUL TREATMENT OF A GREAT GENIUS IN ROME

The sculptor flung himself out of Rome in a rage and returned the same day to Florence. Whereupon the pope suddenly changed his mind again, and must have his monument. But he did not know the man he was dealing with. Papal briefs which would have made other men shake in their shoes did not make Michael Angelo move an eyelash. He had finished with His Holiness.

Three times the pope sent to the chief men of Florence ordering Michael Angelo to be sent at once back to Rome. In the end, for the sake of Florence, the sculptor, sick at heart, obeyed. At that time Julius was at Bologna, brewing trouble. Michael Angelo went to him there and made a bronze statue of Julius, at his orders, with a sword in his hand.

In 1508 he was back at Rome, secretly joyed at the thought of continuing the work on the monument. But that Tragedy of the Tomb, as a writer has called it,

was only just begun. It was destined to cast a shadow over the sculptor's life for some forty years. Pope Julius thought he did not want a tomb just now; he wanted the ceiling of the Sistine Chapel painted. Four years went by, while the sculptor, having begged in vain that Raphael the painter might do it, got through that enormous labour of which we read elsewhere.

A TERRIBLE DISAPPOINTMENT AFTER FIVE YEARS OF GOOD WORK

As soon as the frescoes were finished Michael Angelo turned eagerly to his sculpture, and he succeeded in devoting a year's work to the tomb of Julius II. But very soon there was a new pope. Under the name of Leo X, Cardinal Giovanni Medici, son of Lorenzo, took the place of the warlike Julius.

Leo X had known Michael Angelo when he was a boy at home, and soon after his accession he gave him orders for work—this time architecture. Poor Michael Angelo! He was obliged once more to lay down his tools and proceed to Florence, where the new pope wanted him to build a façade for the church of St. Lorenzo. But this man of superhuman gifts could not resist the joy of any true, creative work. We hear of him next at Carrara, where a large number of men quarried marble at his orders. In his mind he saw the work done—the finest thing Italy had ever seen, please God, said Michael Angelo. Five years passed.

Great columns of marble had been dragged to Florence, workshops were busy there; the most noble façade in Christendom was in the making under the guidance of this indomitable man. Then, quite suddenly, the pope changed his mind. He did not want the façade after all.

The artist's indignation, poured out white hot, rather frightened the pope. His Holiness confided to Sebastian del Piombo, the painter, that Michael Angelo was too much for him.

FATE INTERRUPTS THE WORK OF MICHAEL ANGELO

Presently still another pope, Clement VII, again a Medici, cast his shadow over the artist's path. This time he was ordered to build the Laurentian Library, and set up the new sacristy of St. Lorenzo, wherein the tombs of the Medici should be enshrined. There was scope enough in the scheme of the work, with its bas reliefs and six great sarcophagi, and portrait

statues, to rouse the fervour of an ordinary man, let alone Michael Angelo. Forgetting all that lay behind, he plunged once more into a vast labour. Clement was kinder and more thoughtful than the sculptor's previous masters had been, and for a time all went well. Then fate, in the character of bitter political trouble, stopped the work. Once more the Medici were expelled from Florence. The terrible internal strife that made Italian history about this time a long battle scene, shook first the capital and then the chief towns. In 1529 Florence was besieged; and her leading men, looking round for someone to direct the defences, applied to Michael Angelo.

THE LOVELY FIGURES MADE IN SECRET WHILE FLORENCE WAS AT WAR

The work he did would make anyone think he had been born to be a military engineer. Traces of his fortifications are still in existence. He took on all this extra labour, and worked at the Medici tombs as well. While Florence was being battered at, shaken, he worked in secret at figures for the tombs of the men who had helped to make Florence immortal.

A sharp division came in the sculptor's life in 1534 when his father, at the age of ninety, passed away. Michael Angelo left Florence then for Rome, and never returned to the lovely city on the Arno. He had no sooner arrived in Rome than Clement died. The new pope, Paul III, at once called in the man whose name was now famous throughout Italy, and instituted him artist in chief to the Vatican. At this period the famous Last Judgment was painted on the eastern wall of the Sistine Chapel. A little later he started on the frescoes in a chapel of the Vatican, and by the time they were finished he was seventy-four.

In 1547 Michael Angelo was made architect to St. Peter's, and there he spent the last ten years of his working life. The dome of this great church remains as a testimony for all time of the labour of a man who, judged by ordinary standards, was approaching an extreme old age.

TWO FRIENDS WHO BRIGHTENED THE LAST YEARS OF A GREAT LIFE

Two people had made a fleeting brightness in the artist's later years—his faithful servant Urbino, and good Vittoria Colonna, the Marchesa of Pescara. This lady and Michael Angelo were great Bible readers, poetry readers, thinkers, students of religion, and their intimacy was very

beautiful. In a life so barren of human joys as Michael Angelo's, where the mere thought of marriage had been shut out, this friendship must have counted for a great deal. When her death separated the two friends for ever, Michael Angelo felt that his last earthly happiness had gone. He died peacefully in February 1564, and a whole nation mourned him.

To pass from the life of Michael Angelo to that of Leonardo da Vinci is like passing from magnificent and gloomy mountains and valleys to a pleasant, sunlit plain.

Perhaps this great difference between them was the reason why, when their paths crossed, these two great geniuses did not look with friendliness at each other. Michael Angelo was haughty and cold, and Leonardo was polite and urbane and very sensitive. Like most artists, he resented the sculptor's superiority, and it did not make the position any easier when Leonardo said, "I was a great painter while you were but a youth." But if time has justified Michael Angelo's superiority, time has also made Leonardo an intensely interesting and lovable personality.

THE SINGING BOY WHO LOVED THE FLOWERS AND BIRDS

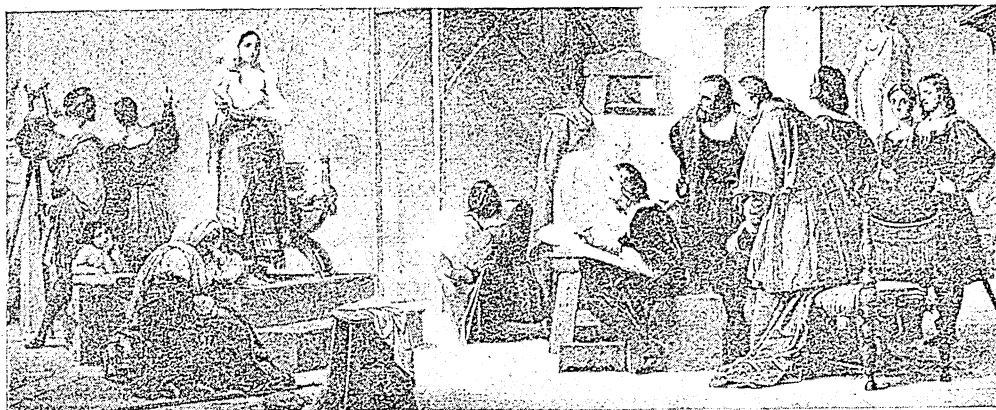
Leonardo was born in 1452 at Vinci, near Florence—hence the name by which he is known. He always insisted on calling himself Leonardo the Florentine; but history has not been kind to him in this one detail. His father, Piero, was a lawyer, an important man in Florence, and had a fine house there, where Leonardo lived until he was twenty-four.

The glimpses that we have of Leonardo's early life are intensely interesting; we feel that he was a man to be loved at sight. He went through his boyhood days happy and singing, so that people smiled when they looked at him. Flowers, birds, and animals were his friends. He went out for long rambling days in the country, and always came back with more treasures for his menagerie.

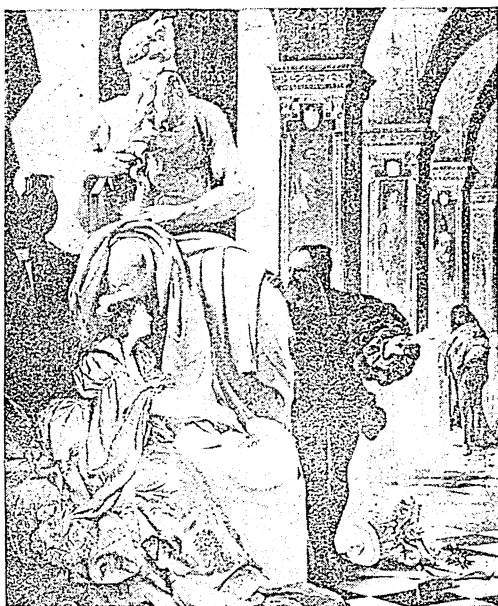
Anything that was alive was beloved by Leonardo—toads, serpents, bats and "creepy-crawlies" innumerable. Where Leonardo was no animal was ill treated. Many and many a time he bought the little singing birds in the street and the market-place, and afterwards gave himself the intense pleasure of taking the cage far from the town and freeing the prisoner.

Much as he loved "all creatures great and small," he had a special overwhelming

THREE MEN WHOSE NAMES WILL NEVER DIE



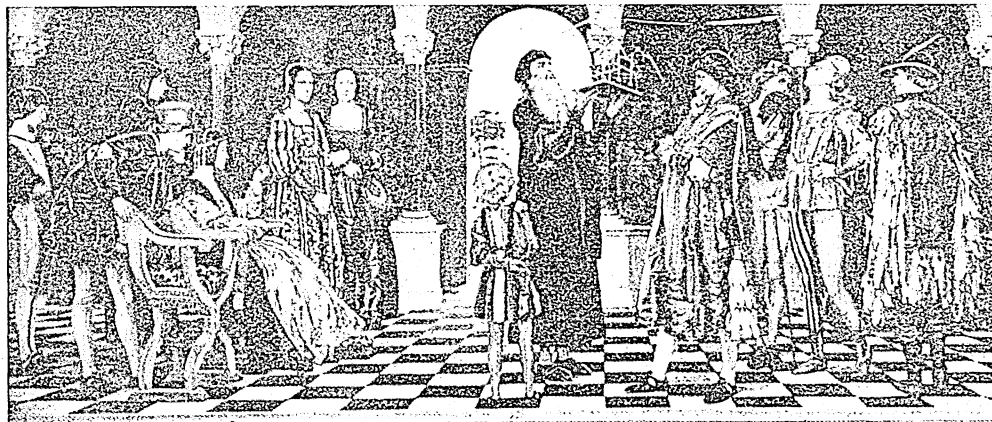
RAPHAEL AT WORK IN THE VATICAN, SKETCHING A MOTHER AND CHILD FOR ONE OF HIS GLORIOUS FRESCOS



MICHAEL ANGELO AND HIS GREAT FRIEND
VITTORIA COLONNA



RAPHAEL AND A
LADY FRIEND



LEONARDO DA VINCI SHOWS HIS IDEA FOR A FLYING MACHINE TO HIS PATRON LUDOVIC SFORZA—FROM THE PAINTING BY ELEANOR FORTESCUE-BRICKDALE

love for horses. There was never a steed too wild for Leonardo to tame and ride. He became a superb horseman; made drawings and studies of horses in every imaginable position and wrote an interesting book on horses and their anatomy.

THE TRUE ARTIST WHOSE SOUL WAS TUNED LIKE A PERFECT INSTRUMENT

Wherever he went he carried a notebook and sketch-book. Sometimes he would wander up and down the streets of Florence just looking for beautiful things, so that his eyes and soul became sensitive to beauty, tuned like a perfect instrument. He grew up into a handsome, athletic man, with much personal charm and great conversational gifts. Fairies must have been busy at his birth, giving him first this grace and then that.

There was nothing in Leonardo of that blindness to all things save art which marked the youth of so many painters. He was naturally of a brilliant intellect, and loved equally music and mathematics, astronomy and poetry. The greatest marvel in the mentality of this man, who is one of Nature's wonders, was the mixture of scientific and artistic genius. He was a gifted musician, and shares with Raphael the first place in Italian painting. He filled a great number of books with notes on all kinds of subjects and scientific inventions that dealt with subjects as varied as canals, flying machines, and the use of steam. It is nothing today to find a young man thus occupied; but we live in a scientific age. Leonardo lived in an age when scientific knowledge was slight.

Before his boyhood years were over, Leonardo decided that much as he loved the pursuit of knowledge he loved art more. And at the age of eighteen he was apprenticed to Andrea Verrocchio the painter, but it appears that he busied himself as much with the chisel as the brush. Presently his name appeared on the roll of the Painters' Guild, and Lorenzo Medici became his patron.

AMUSING GLIMPSSES OF THE DAILY LIFE OF LEONARDO DA VINCI

Leonardo left a great mass of papers and manuscript books dealing with the daily events of his life. Here and there a brief note is very interesting: "Today I began two Virgin Marias." "Today I begin this new book and a new model of the horse." We get amusing glimpses from his own notes and public records of the conditions of an artist's life—as when

he was working for some monks in Florence and they very kindly paid him in advance, and also sent him a load of wood. There is a record, about this time, of the payment to Leonardo, by these monks, of one lira and six soldi for painting their clock. A soldo is a half-penny and a lira is nominally about tenpence. But in those days, of course, the value of money was much greater than it is now.

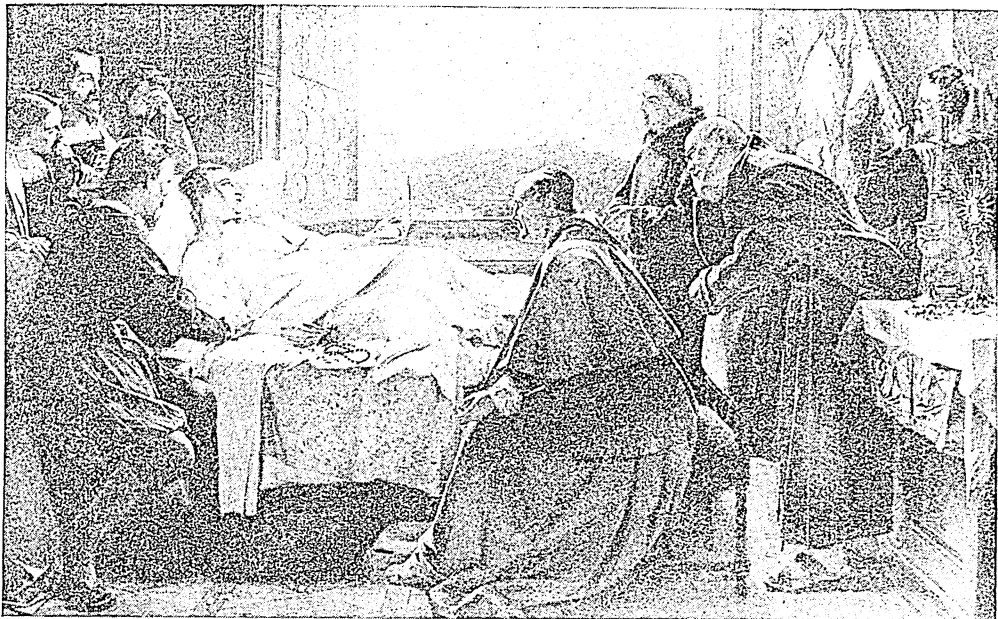
But in spite of these many personal records, there are great gaps in the life of Leonardo which have never been successfully filled by the men who have written about him. Between 1481, when he was living in Florence, and 1487, when he appears at the court of Milan in the service of Ludovico Sforza, nothing is known of him. The Sforza family played a great part in the career of Leonardo. One of Ludovico's projects was to raise a huge equestrian statue in honour of his father, one of the finest commanders Italy has known, who rose from the peasantry to be a fighting leader and Duke of Milan.

THE HIGH OPINION LEONARDO HAD OF HIS OWN POWERS

Ludovico was a great friend of Lorenzo Medici, and he wrote him asking if he could suggest a man capable of making such a statue. Lorenzo knew the kind of person Ludovico was, and it pleased him to send Leonardo with another musician to Ludovico's castle in Milan. The artist bore a present of a silver lute, a present from the Medici prince to the Sforza duke. Whether Lorenzo really wrote, saying "This is the man," the writers do not say. But Leonardo heard of the great project and thought it would be a task exactly suited to his gifts, and he wrote a most wonderful letter to Ludovico asking for the commission.

He explained that he was a born engineer and could design cannon and engines of war; and in times of peace he was the equal of anyone in the matter of architecture of private and public buildings, and in the matter of conducting water from one place to another. He went on: "I can execute sculpture, whether in marble, bronze or terracotta, and in painting I can do as much as any other man, be he who he may. I could engage to execute the bronze horse in eternal memory of your father and the illustrious house of Sforza. And if any of the above-mentioned things should appear to you impossible or impracticable

THE MASTER PAINTER OF ITALY



THE LAST MOMENTS OF RAPHAEL—FROM THE PAINTING BY HENRY O'NEIL



RAPHAEL PAINTING ONE OF HIS MADONNAS IN ROME

The pictures on these pages are reproduced by courtesy of Messrs. Alinari, Manelli, Photochrom, and others

I am ready to make trial of them. . . . in any place that may please your Excellency, to whom I commend myself in profound humility."

This letter is one of the most famous written by any artist. Its apparent lack of humility is excused by the fact that all the statements are true. Ludovico was quick to draw into his service this man of gifts who had already charmed him by his conversation and gift for playing the lute. Leonardo was engaged as artist-in-chief to the Count of Milan at a salary of two thousand ducats—about four thousand pounds.

PERHAPS THE FINEST PORTRAIT OF A WOMAN THE WORLD HAS KNOWN

Ludovico found his artist-in-chief a little trying, because of his trick of leaving one project for another, his passion for beginning again, and his utter inability to be really satisfied with anything he had done. It was always the next model of a horse that was going to be the perfect one. On the whole, Leonardo was very well and kindly treated by the Sforza family. And, although war ploughed its way through the pleasant fields of his life, he never suffered in soul through its destructions as Michael Angelo did.

We have already noticed, in our chapters on art, Leonardo's extraordinary method of painting a picture. To an outsider it seemed that most of his time was spent in front of the easel in rapt contemplation, the brush idle. A vision seemed to enfold him; he forgot about the passage of time, forgot to eat and drink. The fruit of this long sojourn in the mysterious land of the spirit would be a few brush strokes. But those, piled one on another during the patient years, created a picture like the Mona Lisa, perhaps the most wonderful portrait of a woman yet known.

THE TRAIL OF HAPPINESS THAT LEONARDO LEFT BEHIND HIM

Leonardo travelled a great deal up and down Italy, working for this person and that, and sometimes not working at all. Wherever he went he left a radiant memory of his delightful personality and conversation. He must have been the most brilliant man in a brilliant generation. He never lost his passion for mathematics and invention, and more than once was employed as a military engineer during the small wars that were the result of the frequent revolutions in Italy at this time. As he got older he became still

more trying to his patrons. Pope Leo wanted him badly to paint some pictures for him, in company with Michael Angelo and Raphael. But Leonardo gave himself up to working out his lovely dream of a flying machine, and the Pope waited for his pictures in vain.

In 1515 Leonardo passed into the service of the King of France, and presently went to live near his patron. He was getting old and soon laid down his brush. He died in 1519, surrounded by honours, at Amboise, in France.

Italy could not know then, with Raphael only a year longer to live, that her two supreme painters were passing. One had made the name of Florence glorious, another the name of Urbino.

It must have been a matter of regret to the proud Florentines that Raphael could not in any case be claimed by them. Urbino lay on the other side of the Apennines, outside the Tuscan border. Raphael was born there in 1483. His father was a painter—not very distinguished, but of sufficient merit to form an excellent master for his son. The boy was of a sweet-tempered, serious nature, and passed his childhood very happily. He must have learned to draw at a very early age, for when he was only eleven his father realised that the boy was outstripping him and needed to be trained under a better artist than he could hope to be.

THE AMAZING SKILL OF YOUNG RAPHAEL WITH HIS BRUSH

Perugino the painter was living in Perugia at that time, and Raphael's father made arrangements for him to take the boy into his studio. A little later Giovanni died, leaving Raphael an orphan.

It seemed that all his energy and thought ran in the one single course of painting. In this way he was very different from Leonardo and Michael Angelo, his two compeers. Before his youth was passed he had attained such skill with pencil and brush that all who saw his work marvelled.

When he was twenty-one he paid his first visit to Florence. Just then the Medici were in exile, and the sister of the Duke of Urbino sent a letter of introduction for the young painter to Piero Soderini, who was ruling in the Medici's place. The letter throws a faint light on the Raphael of that time. "He is a discreet and amiable youth," wrote the lady, and she begged that for the sake of his

father to whom the Duke had been attached, Soderini would be good to Raphael.

Raphael's chief interest in Florence was the Council Chamber decorations and the cartoons prepared for them by Michael Angelo and Leonardo. All Florence, and indeed towns outside Florence, were talking of the rivalry of these two men, and Raphael lost no time in seeking the Council Chamber. The work he saw there had a tremendous effect on him.

We hear of him presently at Perugia again painting pictures for churches. Then he returned to Florence, and stayed there until he was twenty-five. By this time, although many years younger, he was equal in fame with Leonardo and Michael Angelo. All Italy was whispering about him. But success had not spoiled him; he was still a most indefatigable student and worker. He had none of the tempestuousness of Michael Angelo, none of the exceeding charm and brilliance of Leonardo; he remained the discreet and amiable person recommended to Piero Soderini. And his portrait, painted by himself a little later, fulfils the description of the lady at Urbino.

THE WORK THAT BROUGHT WEALTH AND FAME TO RAPHAEL

Raphael's life was divided into two halves, as Michael Angelo's had been, by the entry into it of Pope Julius II. This powerful old man had got the sculptor in Rome and was furious because Leonardo was busy on some public works in Florence and could not free himself. Julius looked round for another genius. "Where is this young man everyone is talking of?" he said. "This Raphael of Urbino? Send for him at once."

Raphael was in Florence at the time, with two or three pictures not quite finished. When the Pope's summons came he dared not delay an hour. He begged Bartolommeo and Ghirlandajo to finish the work for him, and went to Rome with all speed. There he was set to work on the famous wall paintings in the Vatican.

Raphael made a number of friends in Rome, rich men and men of letters. He found himself famous above all others, and wealthy. He was called the Master, and men came from all over Italy to see him. His pupils paid him a court unequalled in the realm of art since. None of the bitter trials that marred Michael Angelo's life and work came his way, and he never lost his sweetness of temper.

Leonardo, then an old man, came to Rome, and lived in Raphael's house with him. His other friends, like Bartolommeo, also came, and each had the same friendliness given them—a friendliness touched with a charming deference in the case of Leonardo. Raphael seemed not to know what it was to be jealous or bitter. His fellow artists, with the exception perhaps of poor, difficult Michael Angelo, never knew what it was to feel any rivalry in Raphael. But Rome seemed to divide itself in half, one part extolling Raphael, the other Michael Angelo, as the greatest artist on earth.

HOW THE FAME OF THE MASTER SPREAD TO OTHER LANDS

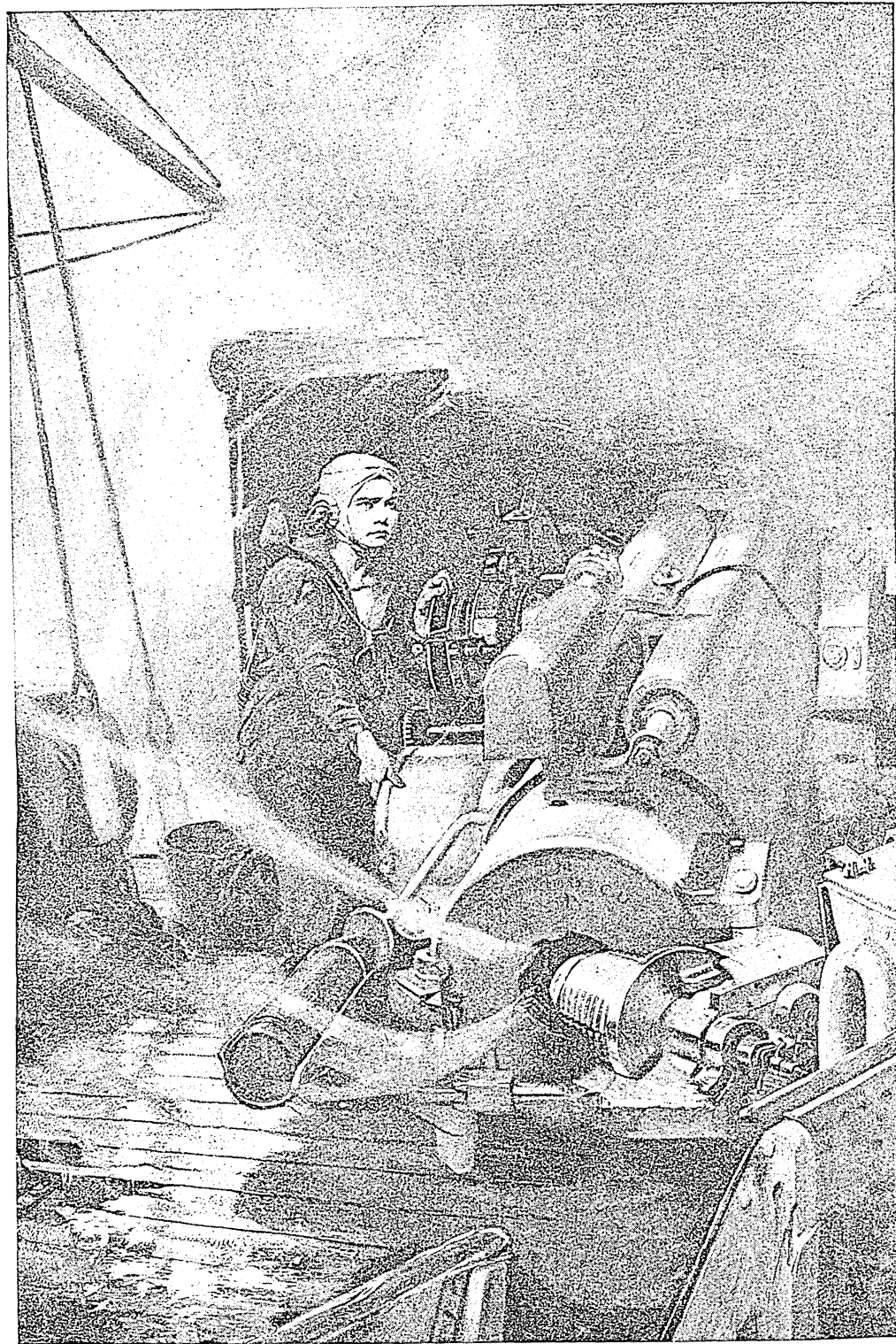
As the work at the Vatican, the wall paintings, the cartoons for the Sistine tapestries, drew to a close, Raphael had become famous not only in Italy but in Europe. Henry the Eighth of England and Francis the First of France both invited him to court, with no result. He stayed in Rome; succeeded Bramante as architect to the Pope, now Leo X, in 1514; and a little later on he became Inspector of Antiquities in Rome, with full power to buy any art treasures he wished. He passed from honour to honour. A great number of men, architects, sculptors, painters, wood-carvers, mosaic workers, were employed by him, and his workshops were as friendly as his house. Such was the man's gift for genial and courteous living.

A large body of pupils, about fifty, went with him daily to and from his studio. Michael Angelo met him, and scowled, and said something about Raphael walking as if at the head of an army. The painter laughed and said that he, Michael Angelo, looked like an executioner on his way to the scaffold.

THE FINE TRIBUTE TO RAPHAEL IN THE LETTER OF A FRIEND

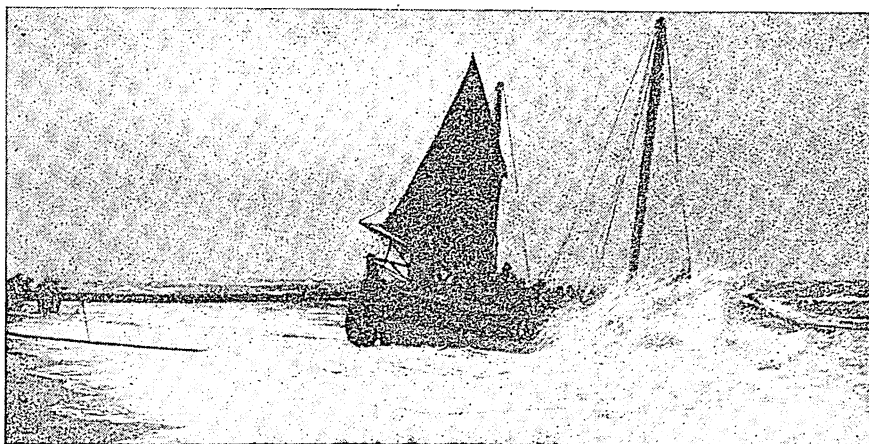
But Raphael did not walk at the head of his army a great while longer. He laid down his brush in the prime of life. In 1520 one of his friends wrote to another at Venice: "On the night of Good Friday, that most gentle and excellent of painters, Raphael of Urbino, died, to the infinite grief of all men, but especially of the learned for whom . . . he was preparing a plan of the antique monuments of Rome. . . Now this glorious work has been interrupted by the envious hand of Death, who has robbed us of this youthful master at the age of 34, and on his own birthday."

JACK CORNWELL STANDS AT HIS POST



IN THE BATTLE OF JUTLAND LITTLE JACK CORNWELL STOOD AT HIS GUN TO THE LAST
The story is told on page 6196. This picture, issued by the Fine Arts Publishing Company, is by Mr. Frank Salisbury
6192

The Great Stories of the World That Will Be Told for Ever



THE RACE FOR THE LIFEBOAT

A LITTLE girl named Margaret, who was born and bred in a fishing village on the Scottish coast, was sleeping alone with her mother one summer night.

While the dark hours wore away the wind rose, and the waves grew big and tossed their manes as they came dashing on to the shore. The mothers and sisters in the fisher cottages awoke and started at the sound. They knew that it meant danger to their dear ones away in the fishing-boats.

As morning dawned they stood on the shore straining their eyes in search of sails. While they waited there in trouble and fear they saw, to their dismay, a ship heaving up and down on the waves, drifting nearer and nearer to the sharp rocks, and helpless to save herself.

The little crowd of women, children, and feeble old men on the beach stretched out their hands helplessly toward the men in the rigging. There was not a fishing-boat left on the shore; all the strong men and boys were away fishing, and who among that group of people could have launched a boat in such a sea? Yet it was heart-breaking to watch men perish before their eyes. "If only the lifeboat men could know!" cried one woman.

Margaret heard what she said, and a bright thought came to her. She asked if the ship could hold together while she ran for the lifeboat four miles away along the coast. Someone shouted that she would not be able to cross the stream, but Margaret was off. Four miles, and the flooded burn lay before her! It raged like an animal; its banks were flooded; and, worst of all, the small plank bridge had been carried away in the rushing flood.

Into the water Margaret plunged. It nearly carried her off her feet, and she gasped and shuddered as it chilled her through and through. Then, rallying all her strength, she forced her body against the current, and inch by inch pressed on. And so the worst was over, and she was out of the stream.

At last the tottering feet of this brave little maid reached the village street, and she had just strength to cry out that there was a ship on the rocks before she lost consciousness. But she had done her work. Kind womanly hands clasped her, and the crew of the lifeboat were quickly in their places. The boat was launched.

Margaret's deed was not in vain, for the lifeboat was in time, and saved the crew of the ship on the rocks.

IMAGINATION · CHIVALRY · LEGENDS · GOLDEN DEEDS · FAIRY TALES

STEFAN OF RUMANIA

STEFAN CEL MARE is one of the national heroes of Rumania. He reigned in Moldavia for nearly the whole of the second half of the fifteenth century. In those days Rumania was divided into two parts, which became united in 1859.

During his reign King Stefan fought fifty battles, of which he only lost two. They were nearly all against the Turks. His country was the gateway between the Christian and Mohammedan worlds. He fought not only for the country but for its faith, so much so that, although he was Orthodox, the Pope sent him a crown and gave him the title of Defender of the Faith.

Once, having lost a battle and been badly wounded, Stefan fled to the castle where his fair wife and his loving mother were safely hidden. He arrived in the dead of night. A cold wind was howling in the darkness and the rain was falling fast. He banged at the castle gate, and his mother appeared at an opening and said, "Who is that knocking?"

"Your son Stefan," came the reply.

"Thou liest," was the answer. "My son would only come back if he were victorious, or else die for his country."

"Oh, give me entrance, my wounds are sore," Stefan cried, but the answer came:

"Go, if thou really be my son. Shame not my white hairs, but go and die on the battlefield for thy country. Let the old and young crown thy grave with flowers, and not thy old age with the name of traitor. Get thee hence!"

Not a word said Stefan, but he turned the head of his weary horse and climbed

the mountain-side to a lonely place where a hermit lived.

He asked the hermit's advice as to what course he should follow. The wise old man, pointing to the valley below, where the scattered army lay, said:

"Thou hast the right to make thy country into a graveyard, but not to give it as a prey to thy foes."

Straightway Stefan sounded his bugle. The followers who were left alive came to his side, and he sent them in all directions to gather the people for the defence of their land.

Then, in some miraculous way, Stefan found himself at the other side of the country, and on a mountain-side he came to a little house with an old woman sitting at the door.

"Good-morrow, good man, what is thy name and thy errand?" she asked. "I have but little to give, but if thou wilt take of what I have I will share it with pleasure," said she.

"I am Stefan, and I want men to fight for the country," said the weary prince.

"I have seven grown sons; take them," the old woman said. "It breaks my heart to part with them, but they are yours."

Stefan won the battle and gave the old woman her sons again, and to the seven sons he gave the seven mountains near their home, which still bear the name of the Seven Brothers.

Stefan went on fighting for the rest of his life, and died of a wound. His old age was crowned with the famous name of Stefan cel Mare—Stephen the Great.

THE MAN WHO WENT THROUGH FIRE

THE scene of this story is the great oil wells on the side of Persia that slopes down into Mesopotamia.

Glowing oil furnaces drive the pumps of a great petroleum well in a village where Robert Leiper Lindsay is in charge, with James Still as his assistant.

Now imagine this. Suddenly a valve bursts, and a hissing gust of oil spurts into the air under a pressure of 700 pounds to the square inch. The open, blazing furnaces are only thirty yards away, and the air around is filled with the liquid fuel they burn. If the oil in the air is set on fire the whole compound will be destroyed.

The quick mind of Lindsay sees at once that the pumps must be stopped and the supply of oil feeding the furnaces must be cut off; so he calls to his assistant to shut

off the pumps, and sets out to cut off the furnace supply.

But to get to the furnaces he must pass through the fountain of streaming oil, and arrive at the furnaces with his clothes saturated with petroleum. He knows what the end will be, but he does not shrink. He passes through the oil shower, turns off the oil-tap of the furnaces, and then turns away, and falls, a blazing torch.

His assistant is successful in shutting off the pumps, but is cut off by heat and smoke, and is almost stifled. He manages, however, to escape through a window and limit the damage, so that the work of the well can go on.

He lived, too, to bear witness to the undaunted heroism of his mate, whom duty had carried to almost instant death.

VIEILLARD-CHRYSANTHÈME

This is a French translation of the story told in English on page 3496

IL y avait une fois un grand seigneur et un brave jardinier qui avaient une chose en commun, leur amour profond pour les fleurs.

Souvent Tsugaru quittait son palais pour se rendre au jardin, et ses courtisans pour le vieux Kikuo ; ensemble ils discouraient des soins à donner aux plantes. Ils aimaient surtout les chrysanthèmes ; en effet, Kikuo était un sobriquet qui voulait dire Vieillard-Chrysanthème : on l'avait surnommé ainsi à cause de son habileté à cultiver ces fleurs.

Un jour un ennemi fit la guerre à Tsugaru, tua ses soldats, incendia son palais, et foula aux pieds son jardin. Tout le monde s'enfuit devant les troupes victorieuses de l'ennemi ; seul Kikuo resta avec son maître jusqu'à ce que tout espoir fût perdu ; alors il s'enfuit avec lui dans les montagnes.

Tsugaru était navré ; d'ailleurs son existence luxueuse ne l'avait guère préparé à la vie rude qu'il lui fallait mener ; il tomba malade et mourut, la main dans celle de son fidèle jardinier.

Kikuo était si triste qu'il ne lui restait aucun désir de vivre, pas même pour revoir une fleur. Mais, au bout d'un jour, il sortit de son abattement, et fit les préparatifs nécessaires à l'enterrement de son maître. Il voulait autant que possible faire honneur à son seigneur. Il n'y avait pas d'argent pour payer un cortège superbe, avec des prêtres, des

bannières, et un tombeau magnifique. Tout ce que Kikuo put faire fut de planter autour de la tombe de son maître une bordure de ses fleurs favorites, large de trente mètres.

Kikuo vécut des années dans les montagnes, cultivant ce nouveau jardin. Enfin, à l'âge de quatre-vingt-deux ans, il tomba malade à son tour.

Un soir, il entendit des chuchotements devant sa cabane, et, levant la tête, il vit à l'entrée une foule de beaux petits enfants vêtus d'or, de blanc, et de rose. Ces petits lui tendaient les bras, et l'appelaient d'une voix caressante ressemblant au souffle du vent dans les herbes :

" Kikuo ! Nous sommes tes Enfants-Chrysanthèmes. Nous t'aimons, Kikuo. Nous voudrions te venir en aide, mais c'est impossible. Tu mourras dans trente jours. Mais où tu iras nous te suivrons, cher père ! "

Soudain la vision s'évanouit. Le lendemain, le vieillard raconta l'histoire à un bûcheron de ses amis, qui venait le soigner pendant sa maladie. Et, en effet, trente jours plus tard le vieux jardinier s'endormit pour la dernière fois, et lorsque le bûcheron se rendit à la tombe de Tsugaru, il n'y restait pas un seul chrysanthème. Tsugaru et Kikuo, entourés des Enfants-Chrysanthèmes, s'étaient retrouvés dans quelque jardin bienheureux.

HEROES OF THE LIGHTHOUSE

A TALE that stirs our blood and makes us proud of mankind comes from France, from the lighthouse at Kerdonis, Belle-Isle. In the lighthouse were the keeper and his wife and their little children, the elder of whom was only ten.

While repairing his lantern the lighthouseman was taken ill. Though she alone could help him, and though his life was in danger, his wife left his side to light the lamp, and then returned to find him dying. Suddenly one of the boys cried, " Mother, the lamp is not turning ! "

The lighthouse lamp was one of those which go round and round. Should it remain fixed it would deceive sailors at sea, and probably wreck their ships. Again the poor woman left her dying husband to examine the machinery, only to find that it had broken down and could not be made to work.

The grief-stricken mother then took her boy and girl, who sat weeping by their father's bed, and set them to turn the lamp by hand all through the night.

They sat in the tower, this little brother and sister, aged seven and ten, faithfully turning the lantern ; nor did they rest from nine o'clock at night till seven the next morning, for the night was black and a tempest raged at sea.

By their united strength the lantern was made to revolve throughout the stormy night, so that no lives should be imperilled ; and while they turned the lantern to give light and save life the light passed out of their father's eyes and the life passed out of his body. Below their mother was weeping over their dead father.

Help came from outside too late to save him, or to spare the tiny heroes from the vigil of this dreadful night.

JACK CORNWELL

JOHN TRAVERS CORNWELL was first-class boy on the Chester, one of the British ships which fought in the battle of Jutland.

In the official despatches describing that terrible contest many names were mentioned of gallant officers who performed lustrous deeds; many instances were cited of the fine handling of ships which make a Briton's blood leap with pride; but in all this stirring record was nothing to excel the story of the boy Cornwell.

His admiral, who was then Sir David Beatty, singled him out for mention above all others, this humbly-born, gallant-hearted lad. Let this famous sailor tell us the story in his own official language.

Boy (1st class) John Travers Cornwell, of the Chester, was mortally wounded early in the action.

He nevertheless remained standing alone at a most exposed post till the end of the action, with the gun's crew dead and wounded all around him. He was under sixteen and a half years.

I regret that he has since died, but I recommend his case for special recognition in justice to his memory, and as an acknowledgment of the high example set by him.

Jack was sight-setter for the gun. This necessitated his being stationed during the fighting in a quite unprotected position. Within less than five minutes of the open-

ing of the battle his gun was put out of action by an enemy shell, and at the same moment he was wounded to death.

But, says his captain, "he remained steady at his most exposed post at the gun, waiting for orders. His gun would not bear on the enemy; all but two of the ten of the gun-crew were killed or wounded, and he was the only one who was in such an exposed position. *But he felt he might be needed*, and, indeed, he might have been; so he stayed there, standing and waiting under heavy fire, with just his own brave heart and God's help to support him."

First-class Boy Cornwell felt himself one of those whom England expected to do their duty.

They bore him back to Grimsby, and there, in the hospital, the nurses asked him how the battle had gone. "Oh, we carried on all right," he said simply.

He knew of our victory and was content, and he said nothing of his own immortal deed. He lived only twenty-four hours after being carried into the hospital, and his mother arrived from London too late. "I know Mother is coming; give her my love," were his last words.

The little hero's body was buried at Manor Park Cemetery, but when the news of his heroism was published he became a national hero. Dead though he be, his memory has become immortal.

THE BOY WHO SAVED HIS FAMILY

ABOUT two hundred years ago the Huguenots, who were the Protestants of France, were being bitterly persecuted for their religious beliefs. In the village of Thorigne lived a weaver named Daniel Bonnet. He had a wife and three children, the youngest being a little boy of five.

As they were Huguenots, suffering great hardships, they decided to leave France and go to America, where they would be free to worship God in whatever way they liked.

When all was ready they started off; but in order to get away safely they put their three children on the back of a donkey and covered them over with vegetables. Then they set off as though they were going to market, for if it had been known that they were going they would have been stopped.

Not long after they had left the village one of the soldiers saw them, and, suspect-

ing that they had hidden their children under the vegetables, he rode up and said with a sneer: "Going to market, are you? Then I will try if your carrots are tender."

With that he drove his sword into the load on the donkey's back with all his might, but, hearing no sound, he thought he must have been mistaken in his suspicions, and galloped off.

We can imagine the agony which the poor parents felt. They dared not stop to see what had happened, but had to go on until they were far away from everyone and out of sight.

When at last they took off the vegetables they found their little boy had been stabbed through the thigh. The little fellow looked up at them, and said, feebly but with pride: "But I did not speak, Mother," and then fainted away.

Thanks to his courage, the family were able to escape across the sea, and to found a new home in a happier land

Nature's Wonderful Living Family in Earth and Air and Sea



This picture of Summer, by E. A. Hornel, is the property of the Walker Art Gallery

BUTTERFLIES AND MOTHS

HUMAN genius has never invented anything lovelier than a butterfly, or anything as wonderful. In the lore and legend of the ancients, in the fairy tales beloved of us all, nothing excels the surprise, the startling succession from repulsiveness to dainty charm, of this creature's strange career.

It is a delightful fact that any child may observe for itself the entire amazing life-cycle of these little wonder people of the gardens and the wilds, beginning with the tiny egg, feeding the caterpillar which results, guarding the chrysalis into which the grub passes, and finally witnessing the rending of that tomb-like husk, and the bursting forth of a winged thing of the air, lovely as a floating flower, scented like one, the perfect butterfly.

Men deeply versed in the subject have sought to classify the eggs in the hope of recognising species by them, but the attempt fails. Take the eggs from their natural surroundings and mix them with others, and they are hopeless as a guide. And the difficulties go deeper than that. There are times when, in the presence of the perfect insect, we are puzzled to say why one is a butterfly and another a moth. It is simple enough to distinguish be-

tween a clothes moth and a cabbage-haunting butterfly; but there are features in which moths so closely approach the butterflies as to make it a delicate matter to define the border line.

In effect the border line is much less sharply drawn by Nature than by entomologists. We who have followed this course of study have seen in almost every aspect of higher life how one form emerges in another, how, though many links are snapped, sufficient remain to reveal to us the unity, the one-ness of Creation, the branching out of a multitude of species from a common stem.

And so it is here again. There are definite formulas to guide us, but exceptions abound to keep alive our sense of the extremely fluid character of the boundaries between the two kinds of our present group.

First, then, a butterfly flies by day, a moth by night. That holds good to this extent, that butterflies never fly by night; but, as against that, there are many moths which fly by day. Indeed, in warm latitudes, where bats and other night-flying enemies of insects abound, moths which pursue their calling in the hours of darkness are rarities.

PREHISTORIC LIFE · MAMMALS · BIRDS · REPTILES · FISHES · INSECTS

Another comprehensive rule is that butterflies have their antennae thickened at the extremities, after the manner of little clubs, while moths have their antennae fringed or feathered. But we look at a Burnet moth to find thickened antennae-ends here, and are reminded again that our law is not without exceptions.

A LITTLE STRANGER THAT WAS WORTH ITS WEIGHT IN DIAMONDS

Rule number three is that the butterfly, when at rest, raises its wings over its back, so that they are at an angle of 90 degrees to the body, whereas the moth reposes, with its wings down, in penthouse fashion, the rear wings hooked to the front pair. Yet some kinds of Skipper butterflies when resting flatten out their wings moth-wise, though they are free of the hook-and-eye attachments.

Not that we know all there is to be learned. There is always the possibility of fresh discoveries even in lands so thoroughly worked over as Great Britain. During 1924 Professor Weiss, of Manchester University, reported the presence in numbers of unique moths which had established a fine family in the hollow of a tree on Kersal Moor, near Manchester.

In no respect more wonderful than any other moth, this little stranger was deemed worth more than its weight in diamonds from the fact that it had never before been seen alive in England. If we but knew how that family of moths came to so unlikely a place we should have a new chapter to add to the fascinating story of the migration of these frail insects.

The question of these migrations is extremely mystifying. Regularly we receive from the Continent, sometimes as single spies, sometimes in whole battalions, the Clouded Yellow, the Pale Clouded Yellow butterflies, the lovely Painted Lady, the Red Admiral; sometimes, too, though more rarely, the precious Black-veined White, the Bath White, the Camberwell Beauty, and the Long and the Short Tailed Blues.

THE MYSTERY OF THE PAINTED LADY'S YEARLY FLIGHT OVERSEA

Darwin saw clouds of butterflies streaming out to sea from South America; more recently they have been seen bravely flying 1200 miles from the nearest possible land, Africa. Midsummer madness or the might of an overwhelming air current must be responsible for such great flights as these, but the regular occurrence of flocks

of butterflies from the Continent within our island gates makes us wonder whether they come by accident or design.

Does our lovely voyaging Painted Lady yearly set her wings at a venture and flap careless with the singing sea winds, or is she fired with the impulse which animates the birds, to go forth and conquer new worlds for her children?

Dry watercourses in arid lands suddenly become torrents in the midst of unbroken drought, because far away rain and tempest have newly stored vast watersheds with moisture from the heavens; and, like the Hebrews' quails in the desert, little beauties mounted on jewelled wings appear in our midst because some wordless order from Nature has bidden them rise and fly to us and elsewhere, their Promised Land. We see the effect but dimly surmise the cause.

The unexpected coming to us of these fair visitors from afar does not exhaust the perplexities of distribution. We find just as much food for wonder in the goings and comings of species which are our own. Which is the more thrilling, the finding by Professor Weiss of rare moths in a tree hollow on a Manchester moor or the amazing story of the moths of an Argyllshire coalmine?

EXQUISITE GEMS OF BEAUTY FROM NATURE'S MATCHLESS STORE

Here we have no rare moth, but common examples of the Noctulids, as strangely housed as those frogs, toads, and birds which have been found of late in the working of gold mines in South Africa. Presumably Noctulid eggs or caterpillars must have been carried down this coalpit on fodder bought for the mine ponies. For there are the moths and their young, breeding in rapidly succeeding generations, the caterpillars feeding on the horse's fodder, the moths maturing, flying in the darkness and laying more eggs where the caterpillars may profitably pass their youth and make their wondrous change.

The way in which moths and butterflies hide their eggs must often effect remarkable changes of habitat in this way, but there is a twin mystery of a different order attaching to the question.

It should be advantageous for the eggs to lie snug and unobserved of creatures to which an insect egg is a dainty. Yet eggs of the moth and butterfly are among the most exquisite gems of beauty;

BUTTERFLIES AND MOTHS

lustrous as pearls, daintier than hand-wrought jewels, fluted, ribbed, patterned in a score of different ways, perfect as works of art, yet contrived with marvellous skill for the admission of the substance which renders them fertile, and compounded of such material as to afford the larvae their first meal from the shells when hatching has taken place.

Such beauty as this, we might think, would but render the eggs conspicuous and so expose them to danger; there is safety in obscurity. But the plan succeeds, and the charm of form, texture, and colouration by which the eggs are characterised must be accepted as another item of evidence that Nature has, throughout her scheme, the same desire for beauty which she reveals in the features of a lovely woman, in the colours of the rainbow, in the eye of a deer, in the grace of a tiger and the symmetry of a noble tree.

The second element of mystery as to the eggs is how the parents know where to lay them.

Any boy or girl collector knows where to look for the eggs or larvae of the species. They know what to expect from the dead nettle, from the privet, from the lime, from the cabbage, from the oak and the apple, because moths and butterflies are true to their habitat.

A SUPREMELY WONDERFUL THING IN THE LIFE OF A CATERPILLAR

As the foliage or tree-trunk on which it was nurtured in an earlier form of existence. This is supremely wonderful. No moth or butterfly eats. At most they drink the nectar of dashing flowers, or, as in the case of the gaudy Red Admiral, sip the juices of decaying flesh or the fluid of a puddle. But solid food has no meaning for them. They have no mouth parts for such food; some have not even the apparatus for the taking of moisture.

Yet all lay their eggs on a medium which will be cradle and larder to the caterpillars into which those eggs will turn. Each is a little Moses to whom the appointed plant or other growth is like a Mount Pisgah beyond which they may not go. Their progeny will inherit the riches in which they themselves can have no share.

It is always the right food on which they lay their eggs. Some caterpillars are such lusty fellows that they thrive on a generalised diet, and can go from

one plant type to another without ill effect. Generally, however, there is one food and one only for a species, and if that fails the caterpillar will die in the midst of abundance, starved where a myriad other caterpillars of different species flourish. The parents, to whom solid food has no meaning, infallibly find it for the offspring which they may never live to see, which will never be able to return them thanks.

THE UNERRING INSTINCT THAT ANSWERS NATURE'S SOUNDLESS CALL

In a sense, but only partially, this return to the cradle stock resembles the return of the adult cuckoo for egg-laying to nests similar to that in which it was reared. But the cuckoo passes through no transformation, no stage of forgetting. It is fed by its foster parents and carries the recollection of them, their nests, and their habits all its days.

Between the caterpillar stage and that of the perfect insect there is a gulf as of living death, when all recollection of food eaten must be obliterated. Yet Nature, by some secret, soundless call, hails the parent to the appointed tree or bush or weed, and there, on the very substance essential to the creature yet unborn, the egg is fixed. There is no more perfect example in the world of unerring instinct.

Like the flies, the moths and butterflies when they leave the chrysalis are fully developed; there is no after-growth for them, whether they be tiny moths of the leaf-mining group, a mere eighth of an inch across the wings, or the giant Atlas moth of Africa, the Titan of all the Lepidoptera, which, of bat-like proportions, has a wing span of nearly a foot!

For the three stages of life, the larva, the chrysalis, and the perfect insect, or imago, condition, the caterpillar must eat such quantities of food that all actual growth may be then accomplished. The succeeding steps are those of change, not extension of size.

MAGIC OF THE BUTTERFLY'S GLORIES REVEALED IN ONE BIG WORD

The ugly word *Lepidoptera* is the scientific description of the whole order of moths and butterflies. It tells in a single group of letters the magic of the butterfly's glories. All these insects have their wings covered with scales, and their name means scale-winged.

Not the faintest suggestion occurs in the make-up of a caterpillar that such a

process is to be wrought in its adult condition. The skin may be smooth, it may be spiny, hairy, armed with sharp prickles tipped with natural gum, but never a vestige of scales. Except that it has a very complicated head, with tough, horny jaws, eyes, and feelers, it might be a worm with legs.

Yet how different is its career from that of the worm. Having eaten the shells of the eggs from which they emerge, the caterpillars begin a campaign of gorging and splitting. There is no other word for it. They live to eat. Behind the head are three pairs of jointed, horny legs and claws which serve in the main to grip the food on which the larva feeds.

These occupy that part of the body which will be the chest or thorax of the butterfly, and from which three pairs of legs and two pairs of wings will arise. From the rear part of the caterpillar's body spring four pairs of fleshy false legs, pro-legs as they are called, which will vanish in the chrysalis stage. Behind these again are two claspers at the end of the body.

THE ENORMOUS APPETITE OF DIFFERENT FORMS OF LARVAL LIFE

These claspers play an important part in the activities of geometer caterpillars, commonly known as span worms. Here the larvae have only two pairs of pro-legs instead of the customary three, and, instead of marching forward with the flowing motion of the ordinary caterpillar, it arches its body, then, gripping by the claspers and pro-legs, throws itself forward, retaining its grip in the manner described until the fore part of the body has reached a new position.

Like most other insects, caterpillars breathe by means of air tubes which open to the surface of the body. These we may see for ourselves along the sides of the body. The grub dies if these are sealed, and so it is a matter for wonder that the poor thing does not meet with disaster when the time comes for it to moult. For the caterpillar does moult; its entire skin has to be cast, again and again.

It eats and eats till it can eat no more, till the body has grown so great that its skin must burst unless the larva gets out of it. As the time of crisis approaches the grub grows lethargic and its appetite fails. It might be sickening for death instead of for a new jacket, so ill it seems. But at the appointed moment the skin splits down the back, and out crawls the

caterpillar with a new and lustrous skin already in position beneath that which it discards as outgrown.

Appetite again returns, and once more the story of gorging is continued. The amount of food eaten is truly enormous when we consider the size of the diner. The privet hawk-moth caterpillar devours 11,000 times its own weight in food during its larval life. The larva of *Polyphemus* consumes three-quarters of a pound of leaves and half an ounce of water during its lusty two months' career, a quantity equal to 86,000 times the weight of itself at birth.

THE GOAT-MOTH CATERPILLAR'S AMAZING POWER OF DESTRUCTION

It is not surprising, then, that the caterpillar of the goat-moth finally reaches a weight 72,000 times as great as the weight it represented when newly hatched from the egg. But the goat-moth caterpillar is one of the marvels of the tribe. Its egg is laid in a chink in the bark, whence, when hatched, the larva creeps into the tree, gnawing a way before it as it goes.

At first its tunnellings are small, like itself, but as time goes on these become considerable, so that at the end of three, four, or five years of the larval stage the caterpillar has done serious damage to the tree which is its home and its meals.

But there are other places than the interior of oak tree trunks for caterpillars. We find them in the woods of many trees, in reeds, down in the soil among roots, but, of course, mainly on the foliage of vegetation. For defence most of them depend upon protective resemblance to their surroundings. The beautiful markings of the hawk-moth caterpillars harmonise extraordinarily with their leafy background flecked with light, and so do the colour schemes of hundreds of others.

THE CATERPILLAR'S WONDERFUL LIFE-LINE OF SELF-SPUN SILK

Those that are less highly specialised in colour scheme retire to the soil when day dawns, or tunnel the leaves and live there, or spin tents of web and live in numbers together. Others are defended from enemies by poisonous hairs.

Then there are the leaf-rollers which cement together two sides of a leaf or two different leaves, and in that make their home, rendered snug by a couch of web spun from their silk gland. They leave open one end of the retreat, and from that, at the first sign of danger, they back out, spin a strand of web, and so descend out

BUTTERFLIES AND MOTHS

of harm's way. Many others have the same reliance on this self-furnished life-line, and we may see hosts of caterpillars lowering themselves from lime and poplar and oak, swaying from the ladder of silk which is being fabricated before our eyes from the gland beneath the head.

WHEN THE GREAT HOUR COMES FOR THE MOTH AND THE CATERPILLAR

It is in this situation that the poisonous species distil their venom. Some merely cause a flow of virus at a touch, but others, like the puss-moth larva, spit out their poison a considerable distance, like little snakes, which at the moment they seem to resemble. These caterpillars are to be avoided by unshaded eyes, for the fluid causes great pain, temporary blindness, and blistering of a sensitive skin.

Well, whatever the kind, the great hour comes for change. The last meal has been eaten; the caterpillar must prepare for the paramount marvel of its life. It is to become a chrysalis. With the butterflies the outer skin goes, a wisp of silk is woven round the golden husk, and all is over. But the moths invest themselves in elaborate domains of silk.

The woolly bears weave their now useless hairs into their silken cocoons; the larvae of the *Dicranura* masticate such difficult material as wood and even sandstone, and mix that with their silk.

Most wonderful of all, a recently discovered African moth, of the *Nyctemera* group, wraps itself in a cloak of bubbles of its own creating, like the citadel of the cuckoo-spit, and in that passes its time of trance.

Some moths and butterflies have two batches of eggs a year; some only one. Adult insects will in most cases result in the same season from the earlier batch of eggs. Those laid later in the year may carry the cycle as far as the chrysalis stage, which will suffice to withstand the rigours of winter.

HOW THE SILK MOTH HAS BEEN DOMESTICATED BY MAN

There are cases, of course, like the goat-moth and the hawk-moths and others, in which the caterpillars themselves sleep through the winter. The writer had an experience of this with 250 tiger-caterpillars, which were accidentally starved for a fortnight at a critical time of their career, yet survived, thin and miserable, to resume feeding at Christmas and to complete their change in the following year.

Within the chrysalis a marvellous transformation takes place. Not always, for we do not permit it to happen with the majority of silk-moth cocoons. This moth, however, has become an entirely domesticated species, bred in captivity. The females do not seek to fly away, no the caterpillars to wander, but rest in the place where they are hatched and fed.

Silk of unmatched quality is produced by these caterpillars, woven, scores and scores of yards of thread to a single cocoon, to form a rest and refuge while the change from grub to moth is achieved. Only a sufficient number to keep up stocks is permitted to undergo the complete change. The remainder, when the cocoons are spun and the caterpillar deeply entranced within, are steeped in hot water, which destroys life and leaves the human owner to unwind the silk and weave it into the goods of commerce.

Probably bees have been the most beneficial insects we have ever had, but from the dawn of trade and manufacture no other little creature has so romantically enriched the world as the silkworm moth.

THE ROMANTIC ORIGIN OF THE SILK INDUSTRY IN EUROPE

For thousands of years silk has been an abundant industry in China. From China silk-moth eggs were stolen by two Persian monks nearly 1500 years ago, and brought hidden in hollow bamboos to Europe. From that small stock descended all the silkworms which, century after century, spun the silk that made France and Italy famous all over the earth for their products from this delightful material.

During the second part of the nineteenth century disease attacked the European stocks of silk-moths. One of the most important of the industries of two great nations was threatened, and a despairing call was made to that great genius, Louis Pasteur, to check the malady. He had never seen a cocoon, knew nothing of the life-story of the insect. But, nothing doubting, he went to Henri Fabre and asked to see the cocoon which he understood the caterpillars formed.

Fabre handed him one. Pasteur shook it near his ear and said with surprise, "Why, it makes a noise; there's something inside."

Fabre explained that it was the chrysalis, and Pasteur asked him what he meant. "I mean the sort of mummy

into which the caterpillar changes before becoming a moth," answered the famous old naturalist.

"And has every cocoon a chrysalis inside it?" asked the astonished scientist.

"Obviously," replied Fabre; "it is to protect the chrysalis that the caterpillar spins its cocoons."

"Really!" said the great man, humbly.

From that time the modest Pasteur studied and toiled, mastered his subject, and stamped out the disease which had baffled Fabre and all the other naturalists; and so he saved France and Italy from losses resembling those of a great war.

FROM THE UGLY DUCKLING TO THE BEAUTIFUL SWAN OF THE LEGEND

Yes, the cocoon is to protect the chrysalis during one of the master changes of creation. A loathly grub enters the cocoon, divests itself of its skin for the last time, and lies like a hibernating or paralysed animal. It is quite inert, helpless, so cold that you think it dead unless you hold it in your warm hand and see it faintly wriggle. But as it lies there, motionless, what a miracle of transformation is in progress.

Nothing remains unchanged, save perhaps the system of breathing. Jaws, claws, claspers, pro-legs, digestive system, even the very outline, all go, yet if we patiently watch the horny case day after day, we may see a new wonder coming into existence before our eyes. The shape of the head, legs and thorax gradually appear upon the chrysalis case, the spiracles show themselves along the sides; the first rough draft of the Master Artist's work is seen in low relief on the case of chitin. The given hour arrives and the resurrection has come. A hideous grub has vanished; a winged creature, fair as flowers, is here in its place. The case is slowly forced apart from within and the Sleeping Princess is astir and emerging. Or, if you will, the Ugly Duckling has been transformed, and the Swan of legend is before us.

THE MAJESTY OF COLOUR DUE TO THE PROPERTIES OF LIGHT

However, without such aids to appreciation we may for ourselves behold and value the marvel revealed for our delight. Out of the sheltering husk comes a trembling feeble promise of perfection. Its wings are strangely doubled and bent, its scales are all upright, like the coat of a suffering

horse. Courage and strength come with the occasion. A rush of blood is swept from the central supply along the veins of the wings, which straighten out and become pinions of power. The scales, packed as we first see them for economy of space in the prison, settle into their correct positions, and the effect is as if new colour and radiance had suddenly descended on the little stranger.

The colour we see there on those magic wings is not pigment: it is light broken and refracted by those minute scales. There is something before us resplendent as the most gorgeous humming bird, the vainest peacock, the sweetest flower; and all that majesty of colour is due to the properties of light. Butterfly beauty is indeed a vestment of light shattered into abiding glory on tiny scales too fine for the unaided eye to see apart from each other.

Nor is this the end of the tale of beauty and wonder. Butterflies have often been called aerial flowers. Little did those who first bestowed the name dream that butterflies possess not only the colour of flowers, but a kindred scent.

THE SECRET WIRELESS CODE THAT PUZZLES THE NATURALIST

This is not, apparently, the gift of all, but of many, and some common to the knowledge of us all are heirs of the great bequest. In some cases scent glands are local; in others they are widely diffused. The scales of the wings include certain scent plumules, from which a grateful perfume is broadcast, apparently at the will of the owner. We suppose that to be so from the fact that the scent glands communicate with air tubes, by means of which pneumatic pressure can be exerted to scatter the gracious odour as the butterfly desires.

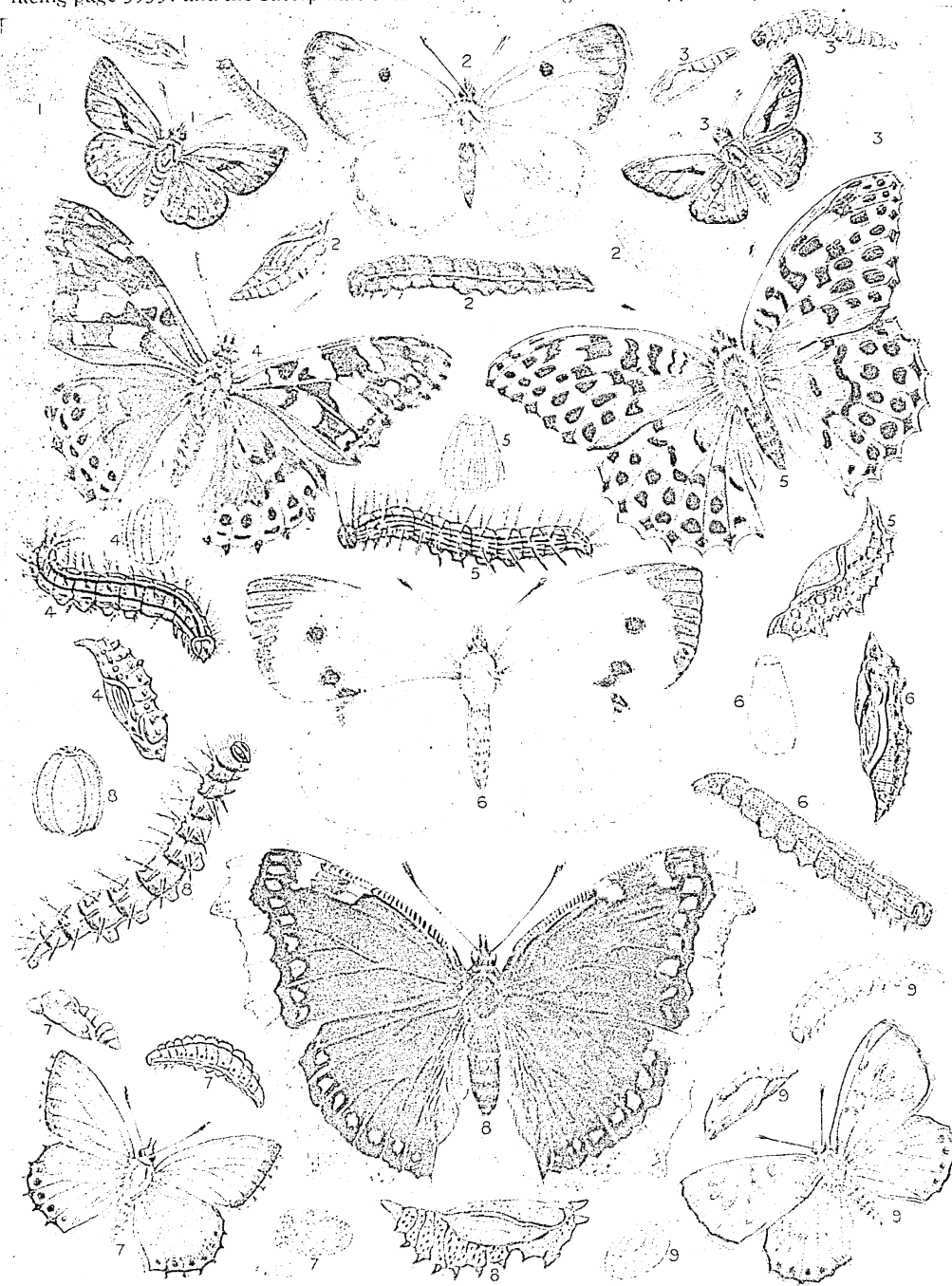
In our common Clouded Yellow butterfly these scent patches are restricted to well-defined areas along the wing, a particular in which this species has its parallel in a tropical representative of our common Brimstone butterfly.

Our Fritillaries have the scent organs along the middle nervures of the fore wings; the Meadow browns and their closest kindred have them on the discs of the fore wings; the Skippers also have scent patches, but in varying positions for different species.

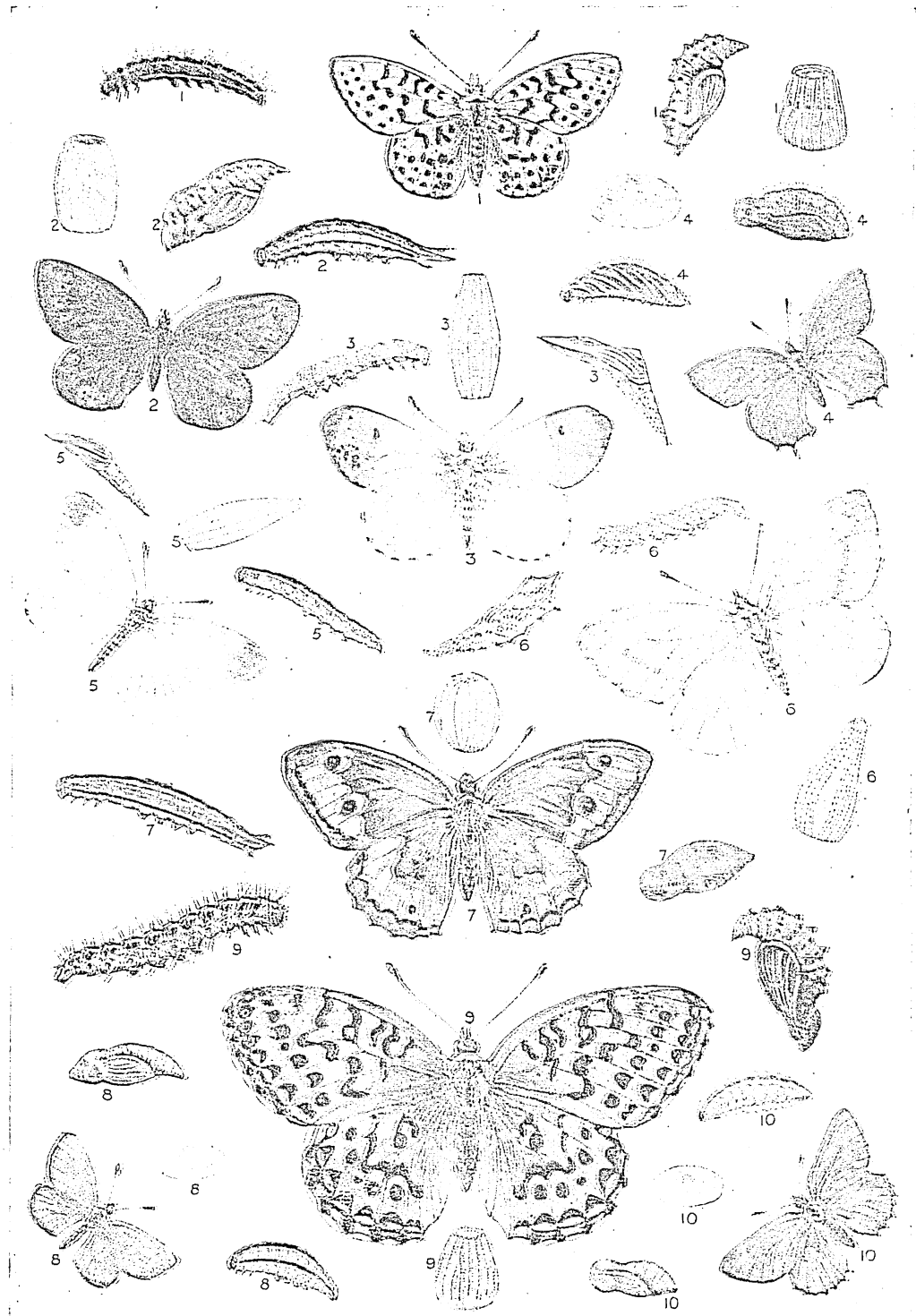
In human society it is women who delight to have scent about their apparel,

BRITISH BUTTERFLIES

We give on these pages a series of pictures of British butterflies in their natural colours, together with the egg, caterpillar, and chrysalis of each. Pictures in colour of Foreign Butterflies and Moths appear on pages 1417 to 1420; pictures of British Moths and their Caterpillars are given facing page 5935: and the Caterpillars of a number of Foreign Moths appear on pages 6209 and 6210.



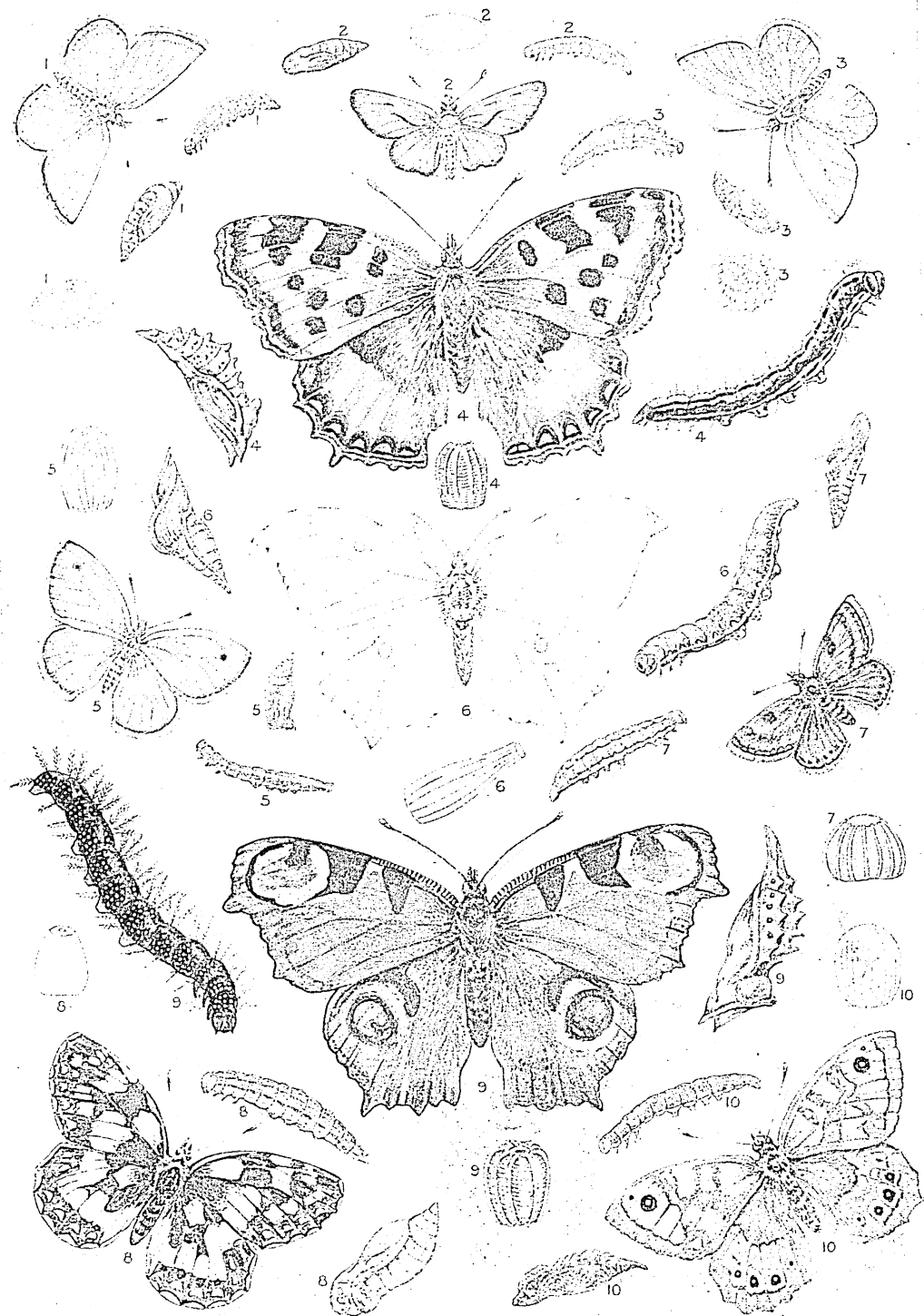
1. Large Skipper (*Augiades sylvanus*) 2. Pale Clouded Yellow (*Colias hyale*) 3. Silver spotted Skipper (*Augiades comma*) 4. Painted Lady (*Pyrameis cardui*) 5. Silver-washed Fritillary (*Argynnis paphia*) 6. Large White (*Pieris brassicae*) 7. Chalk Hill Blue (*Lycaena Corydon*) 8. Camberwell Beauty (*Vanessa antiopa*) 9. Large Blue (*Nomiades arion*)



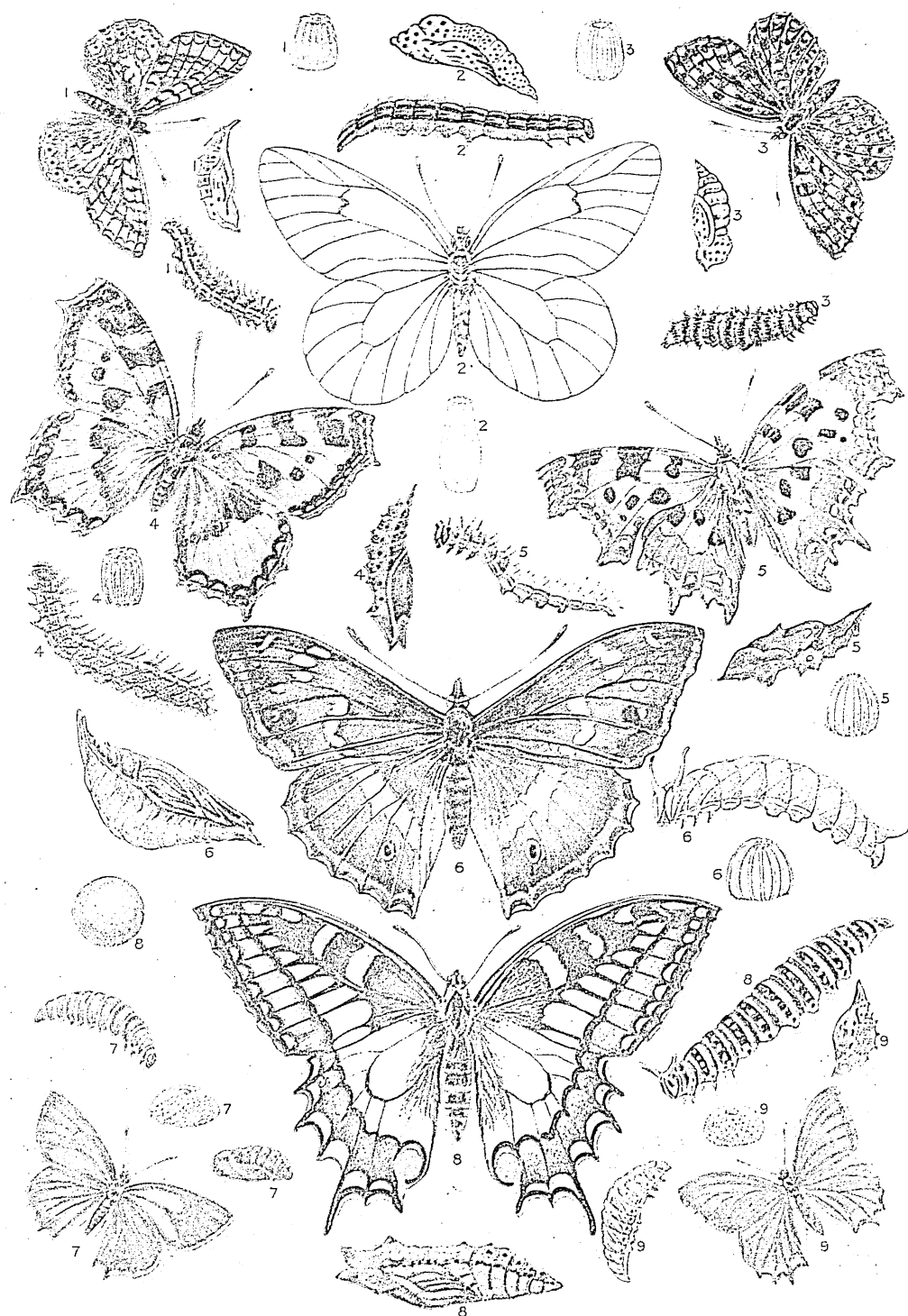
1. Pearl bordered Fritillary (*Argynnis euphrosyne*) 2. Mountain Ringlet (*Erebia epiphron*) 3. Orange Tip (*Euchloe cardamines*) 4. White-letter Hairstreak (*Thecla w-album*) 5. Wood White (*Leucophasia sinapis*) 6. Green-veined White (*Pieris napi*) 7. Grayling (*Satyrus semele*) 8. Silver-studded Blue (*Lycaena aegon*) 9. Dark Green Fritillary (*Argynnis aglaia*) 10. Green Hairstreak (*Thecla rubi*)



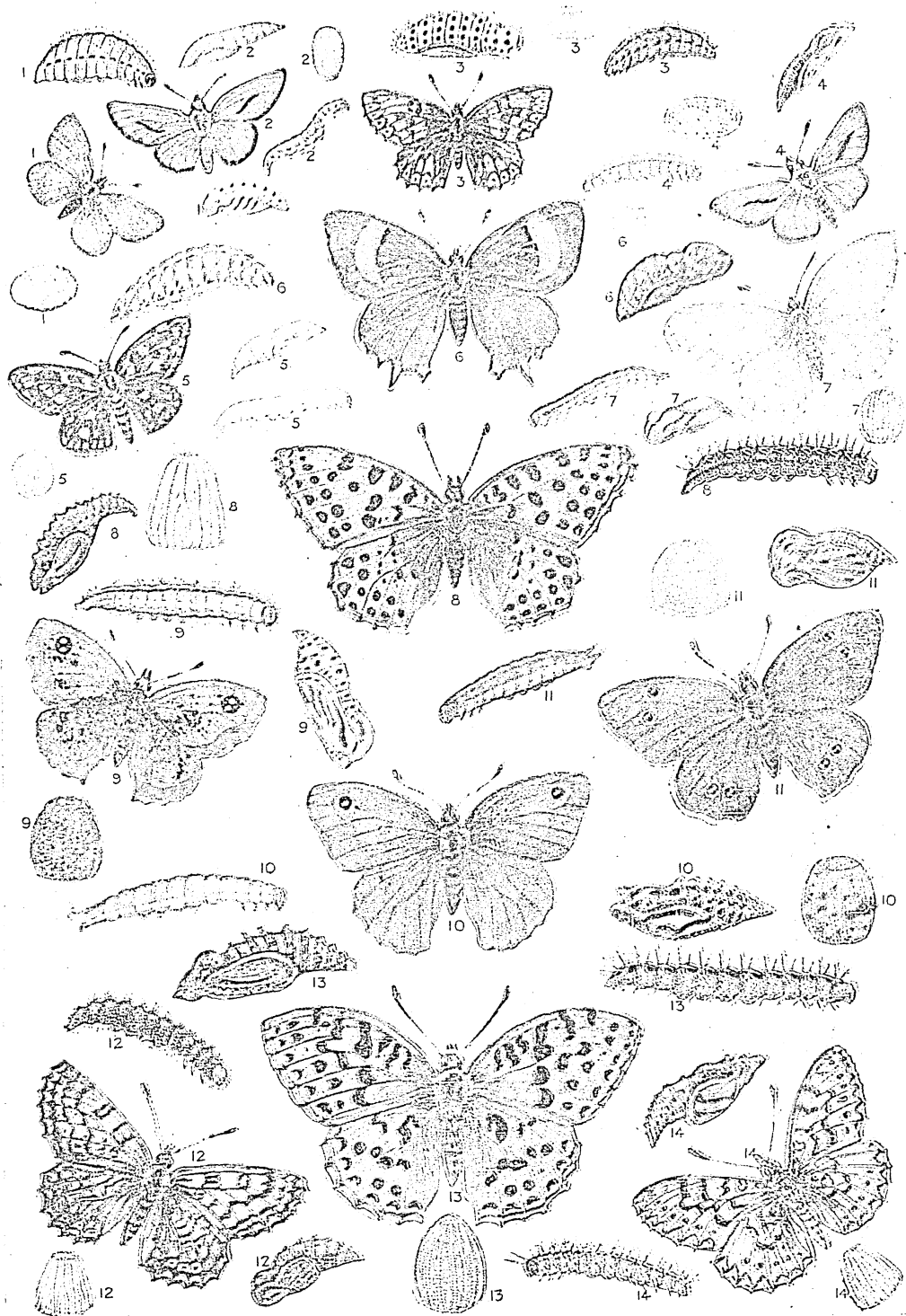
1. Northern Brown or Scotch Argus (*Erebia blandina*) 2. Speckled Wood (*Pararge egeria*) 3. Azure or Holly Blue (*Cyaniris argiolus*) 4. Small Copper (*Chrysophanus phlaeas*) 5. Clouded Yellow (*Colias edusa*) 6. White Admiral (*Limenitis sibylla*) 7. Small White (*Pieris rapae*) 8. Grizzled Skipper (*Hesperia malvae*) 9. Red Admiral (*Pyrameis atalanta*) 10. Brown Argus (*Lycaena astrarche*)



1. Clifden or Adonis Blue (*Lycaena bellargus*) 2. Small Skipper (*Adopaea thauamas*) 3. Common Blue (*Lycaena icarus*) 4. Large Tortoiseshell (*Vanessa polychloros*) 5. Small Heath (*Caenonympha pamphilus*) 6. Brimstone (*Gonepteryx rhamni*) 7. Dingy Skipper (*Thanaos tages*) 8. Marbled White (*Melanargia galatea*) 9. Peacock (*Vanessa io*) 10. Wall (*Pararge megaera*)

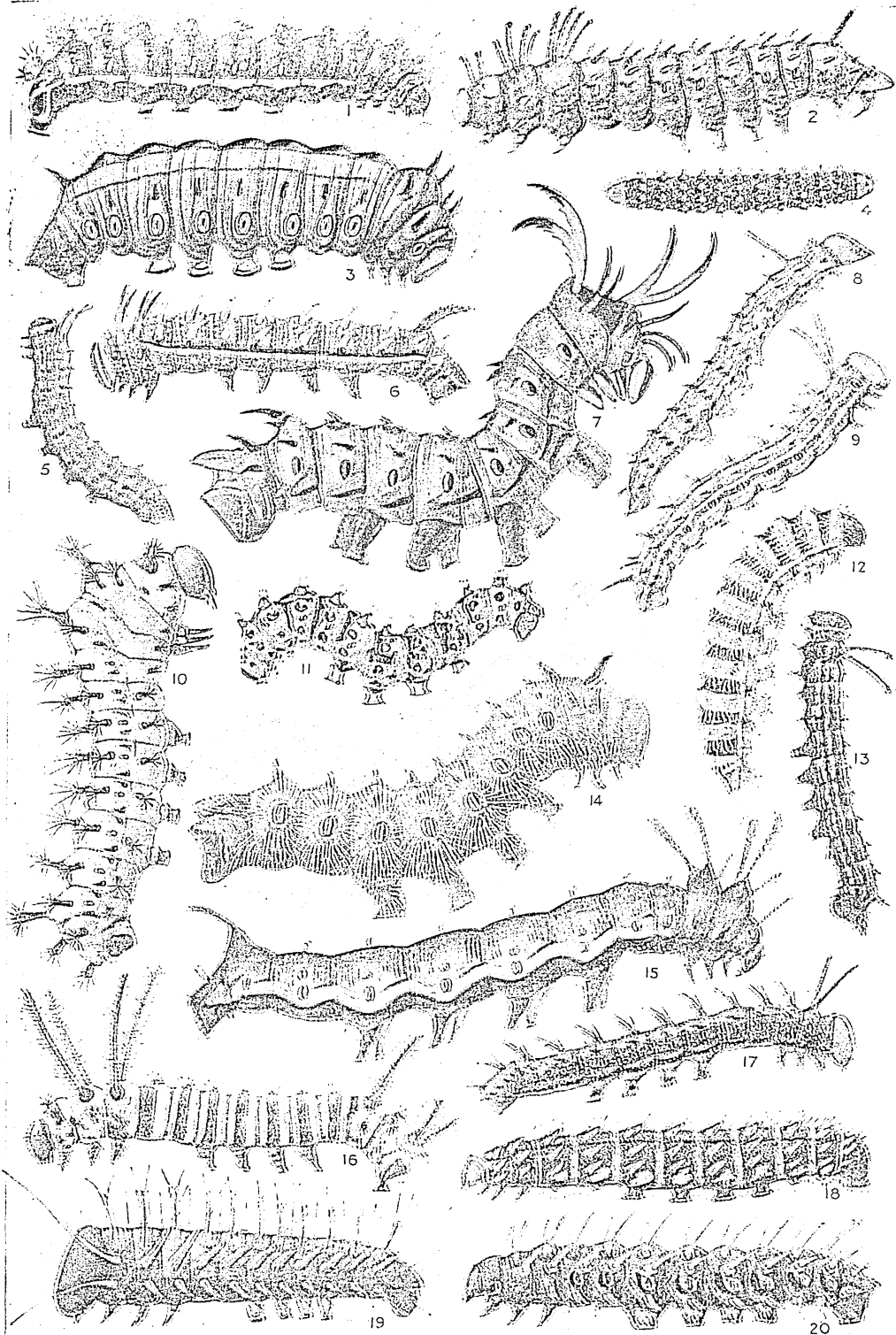


1. Greasy or Marsh Fritillary (*Melitaea aurinia*)
2. Black-veined White (*Aporia crataegi*)
3. Heath Fritillary (*Melitaea athalia*)
4. Small Tortoiseshell (*Vanessa urticae*)
5. Comma (*Polygonia c-album*)
6. Purple Emperor (*Apatura iris*)
7. Purple Hairstreak (*Zephyrus quercus*)
8. Swallow Tail (*Papilio machaon*)
9. Black Hairstreak (*Thecla pruni*)

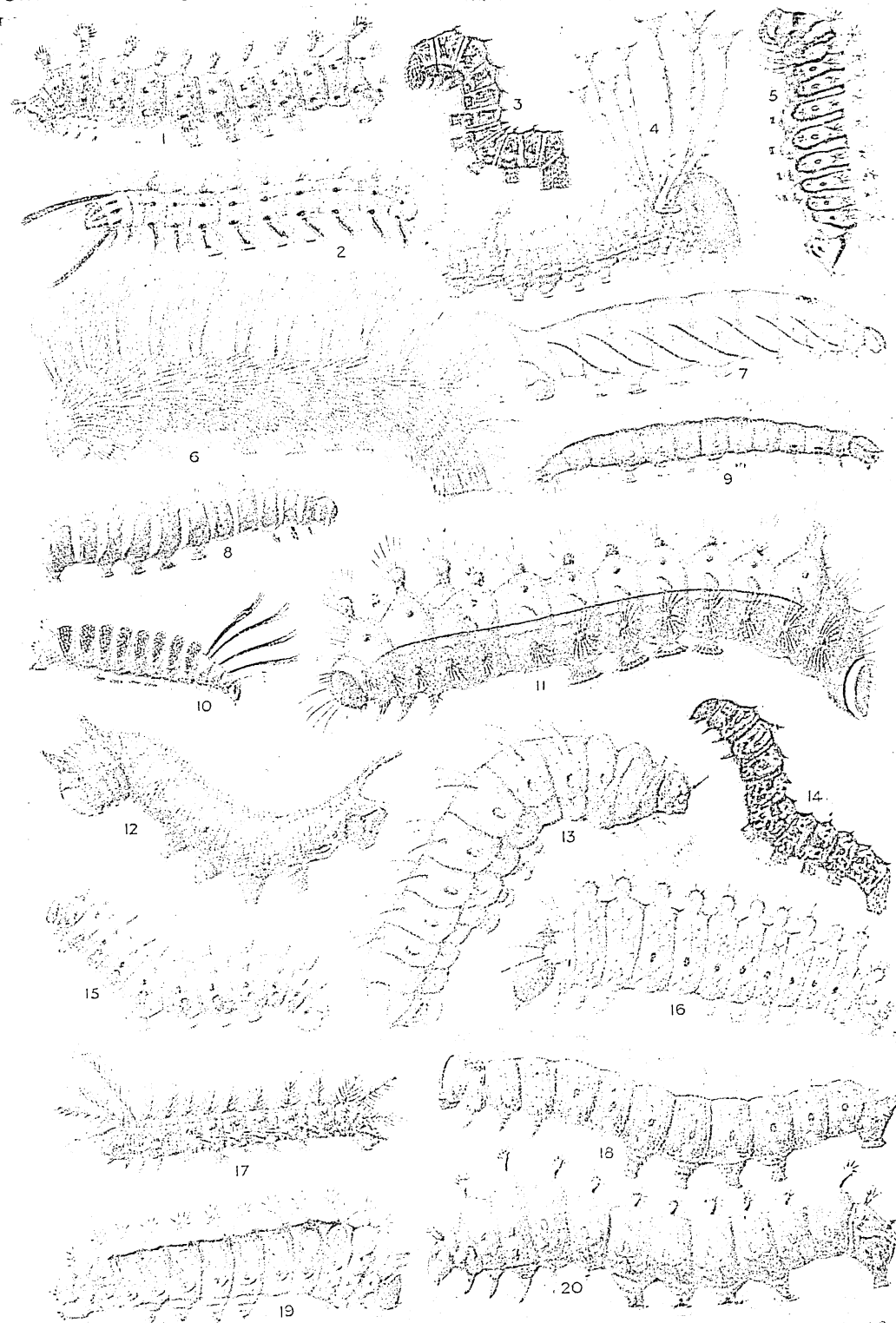


1. Small or Bedford Blue (*Zizera minima*) 2. Essex Skipper (*Adopaea lineola*) 3. Duke of Burgundy Fritillary (*Nemeobius lucina*) 4. Lulworth Skipper (*Adopaea actaeon*) 5. Chequered Skipper (*Carterocephalus palaemon*) 6. Brown Hairstreak (*Zephyrus betulae*) 7. Large Heath or Marsh Ringlet (*Caenonympha typhon*) 8. Queen of Spain Fritillary (*Argynnis lathonia*) 9. Small Meadow Brown or Gatekeeper (*Epinephele tithonus*) 10. Meadow Brown (*Epinephele janira*) 11. Ringlet (*Aphantopus hyperanthus*) 12. Glanville Fritillary (*Melitaea cinxia*) 13. High Brown Fritillary (*Argynnis adippe*) 14. Small Pearl-bordered Fritillary (*Argynnis selene*)

FOREIGN MOTH CATERPILLARS



1. Pear-tree silk-moth of India (*Saturnia pyri*) 2. Laocoon walnut moth of Brazil (*Citheronia laocoon*) 3. *Eacles cacticus* of Brazil 4. *Cricula trifenestrata* of the Himalayas 5. Rosy maple moth of U.S.A. (*Anisota rubicunda*) 6. Honey-locust moth of Texas (*Adelocephala isias*) 7. *Citheronia regalis* of Brazil 8. *Anisota virginensis* of U.S.A. 9. *Anisota consularis* of U.S.A. 10. *Clanorhynchus* silk-moth of California (*Samia rubra*) 11. *Eupackardia calleta* of Mexico 12. *Urota sinope* of Natal 13. *Anisota senatoria* of U.S.A. 14. *Eacles imperialis* of U.S.A. 15. Hooked citheronia of South America (*Citheronia phoronea*) 16. *Brahmea japonica* of Japan 17. *Anisota stigma* of U.S.A. 18. *Loepa katinka* of Sumatra 19. Buck moth of the United States (*Hemileuca maia*) 20. *Bunaea caffra* of South Africa



1. *Samia gloveri* of the Rocky Mountains 2. Vishnu moth of India (*Trabala vishnu*) 3. *Nudaurelia cytheria* of South Africa 4. *Syssphinx molina* of Central America 5. *Orizaba* silk-moth of Mexico (*Rothschildia orizaba*) 6. *Gonometer robusta* of Rhodesia 7. *Chaerocampa celeris* of India 8. *Eusemia bisma* of India 9. *Anticyra combusta* of U.S.A. 10. *Phalanna polymena* of India 11. Moon silk-moth of India (*Actias selene*) 12. Four-horned sphinx of U.S.A. 13. *Atlas* silk-moth of India (*Attacus atlas*) 14. *Thyella tyrhaea* of South Africa 15. *Phylosamia* (*Ceratomia amyntor*) 16. *Telea polyphemus* of U.S.A. 17. *Automeris pamina* of U.S.A. 18. *Coloradia venata* of Argentina 19. *Jorulla* silk-moth of Mexico (*Rothschildia jorulla*) 20. *Columbian* silk-moth of U.S.A. (*Samia columbica*)

but in Nature we find only the male butterflies endowed with the gift of creating a sweet atmosphere with which to attract the opposite sex. The fact that she is a lady suffices as recommendation for the female in the moth and butterfly world.

She can easily trace her scented suitor, but how can he trace her? There we have another mystery of the Lepidoptera. There seems no doubt that they have means of communication unknown to us. A naturalist places a female moth a prisoner in a tiny open-fronted cage, out in his garden at night, when none of her species appears to be within range. Males flock at once to her dungeon from all quarters of the compass.

"They flew for miles" we often hear it said, but there is no proof as to the distance from which the anxious lovers come. That the presence of a little female of their kind does attract the males in astounding numbers is all we know. Even if they fly to her only from hundreds of yards instead of miles, the fact is sufficiently notable. How do they know, out of sight, out of hearing, that she is there?

THE INSECT CRIES THAT OUR EARS ARE TOO DULL TO CATCH

Sight it cannot be, for though moths' eyes are large, and the insects fly well in the dark, the things they see are such as reflect the little light available. All the white flowers which open and scent the air at night are moth lighthouses, stored with nectar for them alone. Even human beings, with their different type of vision, can see white in comparative darkness. But a tiny distant moth? No, it cannot be vision which draws distant wooers and gallants to the little caged princess.

The more we advance into the mysterious domain of wireless, the more men incline to believe that insects in general, and moths and butterflies in particular, have their own natural equivalent of our artificial system. It is clearly proved that a bat, deprived of eyes and hearing, still receives some impressions on its skin which enable it to avoid the minutest obstacle in flying. They have cries so shrill and high that only the sharpest ears of young people can hear them.

If bats are specialised so highly and so unexpectedly, then why should not moths and butterflies be equally specialised in another direction? They may be sending out cries which our ears are too dull to catch, and their antennae may be the

aerials to arrest the sound waves so created. We may never know the truth, but it is certain that entomologists will never rest content so long as the mystery remains unsolved.

The cooperation between the two sexes brings strange things to pass in the world of these insects. Quite a new thing has happened in this connection within the lifetime of young readers of this book, and the detested winter moth is the hero.

HOW THE MALE WINTER MOTH SAVES THE FEMALES FROM DEATH

Female winter moths are wingless. They lay their eggs on the branches of our fruit trees and die. The caterpillars devour the foliage, then, when about to undergo their change, descend to the ground and bury themselves in the earth or in crannies of the bark of the tree.

The new generation of males, when they leave the pupa stage, fly like other moths; but the females, in order to meet their lovers and lay their eggs, must climb the tree trunks, like caterpillars. To prevent them from getting up and sowing the seeds of ruin amid the branches, fruit-growers place bands of grease-proof paper heavily smeared with a thick treacly substance round the boles of the trees. This catches thousands of the crawling females.

At times their numbers are so great that, like the rabbits which at last overtop the wire defences of Australian farms, using the heaps of their own dead as a footpath, the females of the winter moth are able to crawl over *their* dead to the boughs beyond.

But the thing to marvel at is not that, but something very different. Where grease-banding has been for some years generally practised on fruit farms, it was found that the males had learned a lesson; instead of dooming their females to death by the passage of the lethal bands of bird-lime, they met them in a region of safety, short of the death trap, and *carried them to the tops of the trees!*

THE GREAT MOTH THAT STEALS INTO THE HIVE AND CARRIES OFF THE HONEY

If that habit should become general in fruit-growing areas it would mean that one of the greatest of easy safeguards for our orchards has been defeated by an altogether unexpected and amazing example of adaptability in an order of insects credited with a very low order of intelligence. Yet such a thing would not be without parallel.

The great Death's Head moth enters beehives and steals the honey of the workers. The bees could instantly sting it to death if they chose, but because it has a cry similar to the murmuring of their queen they leave it unharmed to pillage them at will. That is a Death's Head habit today, inherited and passed on from generation to generation, but it had a beginning, a conscious inception, as this new habit of the winter moths has had in our own time. There is art, there is craft, there is intelligence of a sort in every phase of animal life, if we have but the patience to explore and the good fortune to discover its operations.

THE ROMANCE AND LOVELINESS OF THE BUTTERFLIES THAT GLADDEN THE EYE

Repellent and destructive in the caterpillar stage, moths and butterflies are things to gladden the eyes and senses in their complete condition. That is, if we can forget the damage for which their progeny is responsible.

Who is there so dead to romance and loveliness as to ban from the scheme of open-air beauties the Admirals, the Peacocks, the Swallow-tails, the noble Swifts, the dashing Hawks and Emperors, the score of species which have Beauty as part of their man-given titles—the Belted Beauty, the Bordered, the Brindled, the Camberwell, the Lilac, the Marbled, the Willow Beauty, and the rest. It is hopeless to begin a catalogue, for it requires entire books to deal with colours, shapes, habits, localities.

Nearly every moth and every butterfly performs useful service, in fertilising the vegetable growths from which it draws its food supplies, or in some compensatory act. Every destructive group of caterpillars has its cousins at work for the good of our land.

THE PENALTIES OF MAN'S INTERFERENCE WITH THE COURSE OF NATURE

Take the clothes-moth, for example. This moth, as a moth, is harmless. It lays its eggs on our woollen clothes, carpets, tapestries, and what not. The caterpillars are the villains of the story; they eat the material and ruin it, spoiling the one good suit which a poor man saves for Sundays and weddings, the one good carpet in his house, the one lovely example of tapestry which church or mansion cherishes. In the same group of moths are those whose caterpillars are a curse to granaries, where they eat much grain

and ruin more. Yet the same tribe affords us excellent allies in the fungus-moth and the four-spotted black, which devours rotting wood and the other sad debris of the wayside.

Moths and butterflies were meant to give rise to caterpillars which should act as a check on excessive vegetation. The clothes-moths would originally be charged with the consumption of wool and hair rubbed from sheep and cattle and other animals whose mass, year after year, would threaten to choke the countryside.

Their natural enemies were birds, innocent reptiles, and insect-eating insects. We have killed the birds and banished the reptiles, and the other parasites cannot keep pace with the enormous increase for which our system of cultivation has made way. Every year we have caterpillar plagues of some sort. In small gardens it often happens that the Large and Small Cabbage White butterflies produce so many eggs that the caterpillars destroy every cabbage that the householder grows.

The Pea moth sullies our peas, in which we find its hateful larvae; there is a vile Codlin moth whose caterpillar by a method of inspired villainy enters our apples, tunnels and defiles them, and causes them to topple at the first gust of wind—wind-falls; there is a moth that haunts the foliage of our currants, another that tunnels them; a moth that bores into the stems of corn.

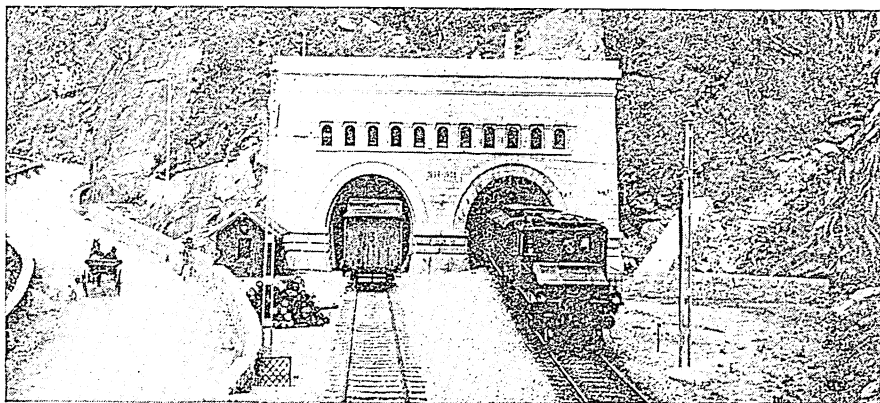
THE CATERPILLAR AS ONE OF THE GRAVEST PROBLEMS OF OUR OPEN-AIR LIFE

Indeed, we have scarcely a single growth in forest, garden, or moor for which Nature has not provided a hungry parasite in the shape of caterpillar from moth or butterfly. Of the little wretches whose larvae mine the leaves of our flowers and vegetables, already over 200 species are known in England alone; and where they flourish not a plant remains unmarred.

Caterpillars are indeed one of the gravest problems of our open-air life. They are the occasion of huge loss to the agriculturist and fruit farmer; they cause unending disappointment and dismay to those whose joy is a garden, large or small.

That is the serious side of the question. The other is concerned with the aesthetic. We like to have butterflies as well as Brussels sprouts and roses, but how to combine them is a puzzle too profound for most of us.

The Story of the Things We See About us Every Day



The Italian end of the Simplon Tunnel

BORING THROUGH THE ALPS

MAN has climbed the mountains and pierced them too; he has made himself truly the master of the ways across the world. What can match his mastery of the Alps—his boring through these mighty masses of rock which stand like Nature's sentinels in the heart of Europe? Through these Alpine tunnels every day hundreds of travellers pass from Switzerland to Italy, in the very heart of the greatest mountains in Europe, with millions of tons of earth stretching for more than a mile between them and the sky.

Let us take one of these tunnels only, the Simplon. The work occupied ten thousand men nearly eight years, and cost over three million pounds.

The two ends of the tunnel—Iselle on the Italian side and Brigue on the Swiss—became cities of industry. At each end a river was harnessed and made to supply power for driving the many kinds of machinery which were used. A new colony sprang into existence at each end of the tunnel, in which were comfortable homes for the workmen and their families, cafés, hospitals, places of amusement.

And, though these little towns were of wood, every place was lighted by electricity made by the running of the harnessed rivers. No workmen ever carried out

their duties with greater comfort in such circumstances. They had special clothes to work in, special provisions in the form of warm and cold shower-baths, and cooling chambers were furnished to prevent their feeling the cold on coming out from the hot depths of the mountain into the chill atmosphere of the Alps. To guard against impure air machinery was built which forced in enormous quantities of pure air and drew out the foul. Few horses were allowed in the tunnel, because the vapours from their bodies made the air impure; and special watering machinery converted the dust of the tunnel into mud, so that the men should not breathe it. The conditions were really excellent, and the men deserved it, for they worked with extraordinary goodwill in terrible circumstances.

Work was begun at both ends of the tunnel at once—with 6000 men on the Italian side, where the harder work was expected, and 4000 men on the Swiss side. Drills driven by hydraulic power were used to bore holes in the rock, and in the holes thus made charges of dynamite were placed and fired. Guns which were fired by water under heavy pressure smashed up the rock which the dynamite dislodged, and long trains carried away

INDUSTRIES · HOW THINGS ARE MADE · WHERE THEY COME FROM

the rubbish and brought in building material, so that solid masonry could be built up to form walls, and to give extra support in place of the rock cut out. Day and night men were at work, working in shifts of eight hours each. All the machinery for the work had to be specially made, and with this the men bored away 18 feet of gallery a day; the men on the Italian side working towards the Swiss side, and those on the Swiss side boring in the direction of the Italian, so that when each side had done its work they might meet in the centre of the tunnel.

THE GREAT IRON GIRDERS THAT NOTHING COULD HOLD FIRM

For a time all went well. Soon, however, those on the Italian side met with unlooked-for difficulties. They broke into very soft and treacherous ground, where they had expected to meet solid rock. To make this secure they erected enormous timbers, but these were crushed to atoms. Heavy steel girders were tried, but so great was the pressure of the moving masses above and all round that these became twisted like wires. Not until quick-drying concrete was built round them could the girders be made to hold up.

Then the workmen came upon an underground river of intensely cold water. It rushed into the galleries at the rate of 12,500 gallons a minute.

The poor men worked in mackintoshes and waterproof boots and leggings, but they were in a shower-bath the whole time, and up to their knees in water, and often in danger of drowning. Drainage systems had to be invented to carry away this fearful river, and after a delay of six months the danger-spot was passed.

A RIVER OF SCALDING WATER, FLOWING AT 250,000 GALLONS AN HOUR

Very soon afterwards, however, the rocks into which they were boring began to get hot and hotter, and streams of scalding water gushed out. Having passed a river of cold water, they now came upon another, which filtered down through the scorching rocks, bringing their heat with it. It flowed into the galleries at the rate of nearly 250,000 gallons an hour—a river of scalding water. Again fresh machinery had to be thought out. The men on the Swiss side also had come upon baking rocks and scalding water. The same idea was adopted for both sides of the tunnel. On the Swiss side enormously powerful pumping machinery was put up, which

pumped in cold water from beyond the end of the tunnel. This was pumped upon the burning rocks and upon the cracks from which the scalding water issued, and so cooled both rock and water.

The plan on the Swiss side worked well, until a great storm at that end of the tunnel caused a landslide, cutting off the water supply which had driven the pumping machinery. The hot water was still pouring in, so the engineers had to put up iron doors across the tunnel where the boring machinery was. To a great extent this shut out the flow of hot water, and enabled the men to go on building up the walls in the rest of the tunnel. And there they had to leave their boring, and wait for the men on the Italian side to work their way through to them.

The brave fellows on the Italian side worked doggedly on. They now turned one river against another. The cold river through which they had fought their way was made to serve the pumps, and to help to cool the scorching rocks and water.

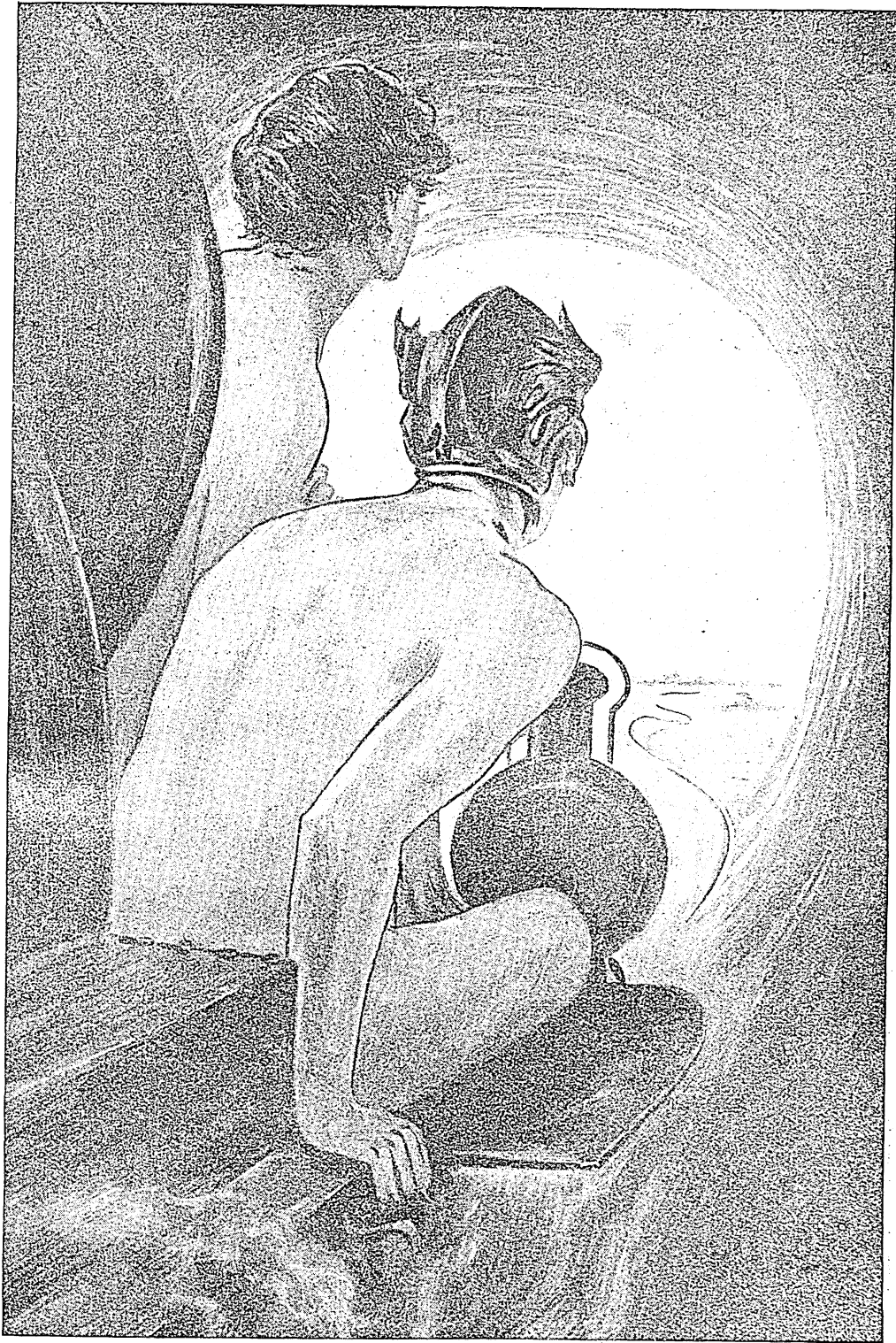
THE LAST BLAST OF DYNAMITE THAT CLEARED THE GREAT TUNNEL

Little by little they worked their way onward to the spot where they expected to break through and find their friends on the Swiss side. They knew exactly the spot at which they *should* break through and make the tunnel complete. They had been for years working in what they hoped was a straight line. Had they gone quite straight, or had they gone astray? There was great excitement on both sides.

At last the men in the Swiss half heard the sound of the drills, and knew that their friends were approaching them. Twenty feet, nineteen feet, then only sixteen feet remained, and so the last barrier was gradually bitten away by the untiring drills. Then came the last charge of dynamite which was to open the way. It was put in and fired, and a hole in the rock eight feet wide opened. To the joy of everybody, they saw that the tunnel was complete. After twelve miles of boring, starting from different countries, the workmen met in the heart of the Alps with only the breadth of a hand between the points of their axes.

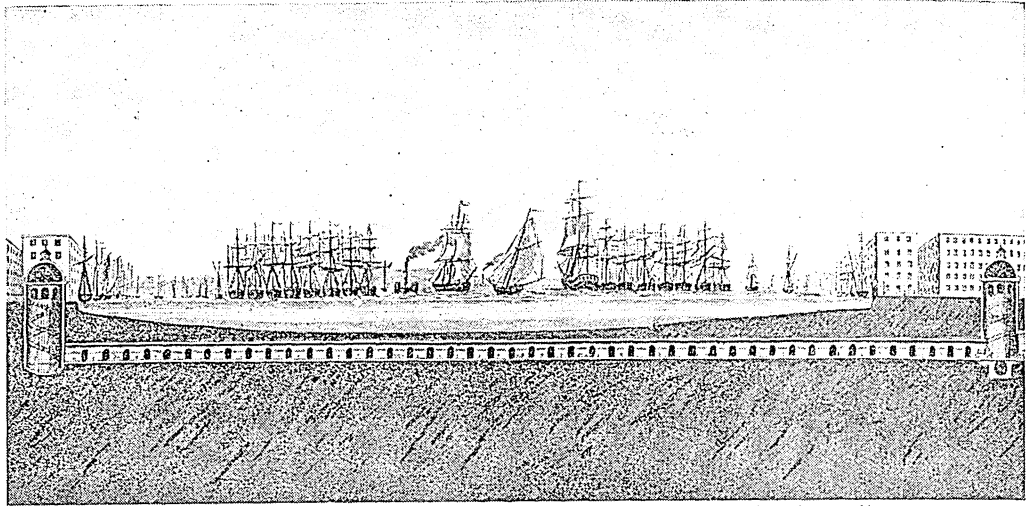
In May, 1906, the King of Italy and the President of Switzerland met in the tunnel, and a month later, nearly eight years from the beginning of the work, trains were running through the Simplon, the longest, deepest tunnel in the world.

PICTURE-STORY OF TUNNELLING

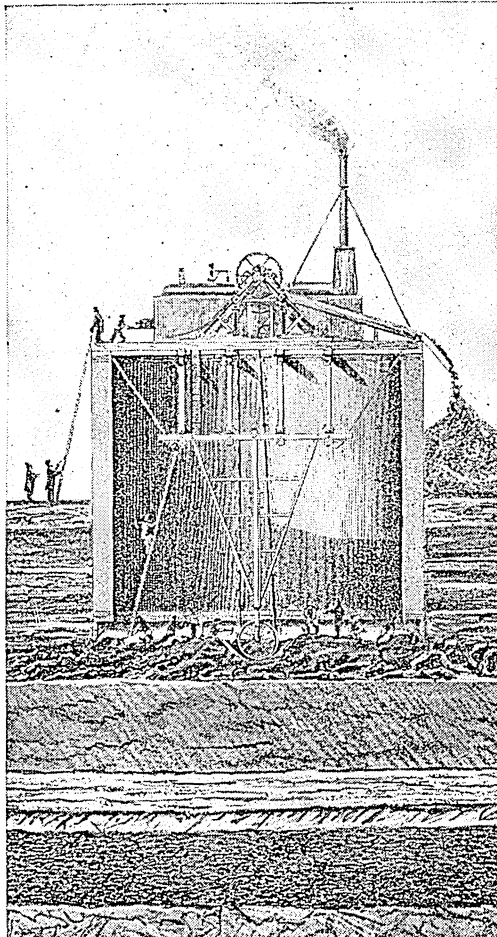


Man has not only tunnelled deep down in the Earth, but he has pierced the mighty Alps, and this picture tries to express the idea of how a living man is now able to come out of the heart of the mountains.

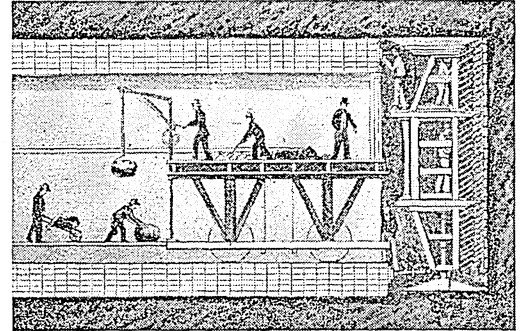
THE FIRST HIGHWAY UNDER THE THAMES



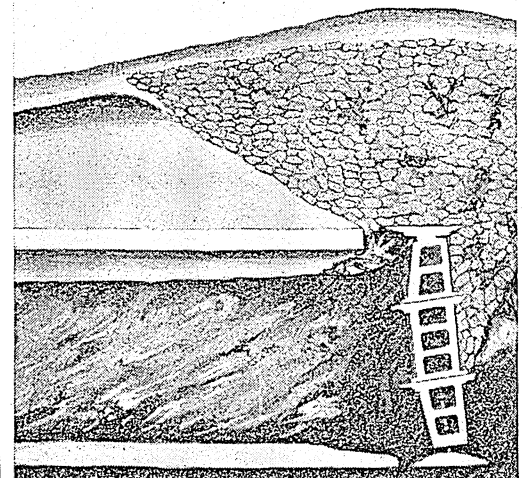
Many tunnels now run under London's river, but the first of these was the Thames Tunnel, built by Sir Marc Isambard Brunel, and opened in 1843. It is shown here in sections, and the first idea of how to bore it was given to Brunel by a little sea-creature, the teredo, which had honeycombed a piece of timber which the engineer picked up at Chatham



A huge caisson or tower was built, weighing hundreds of tons, and men worked inside this, digging out the gravel while the caisson sank by its own weight.

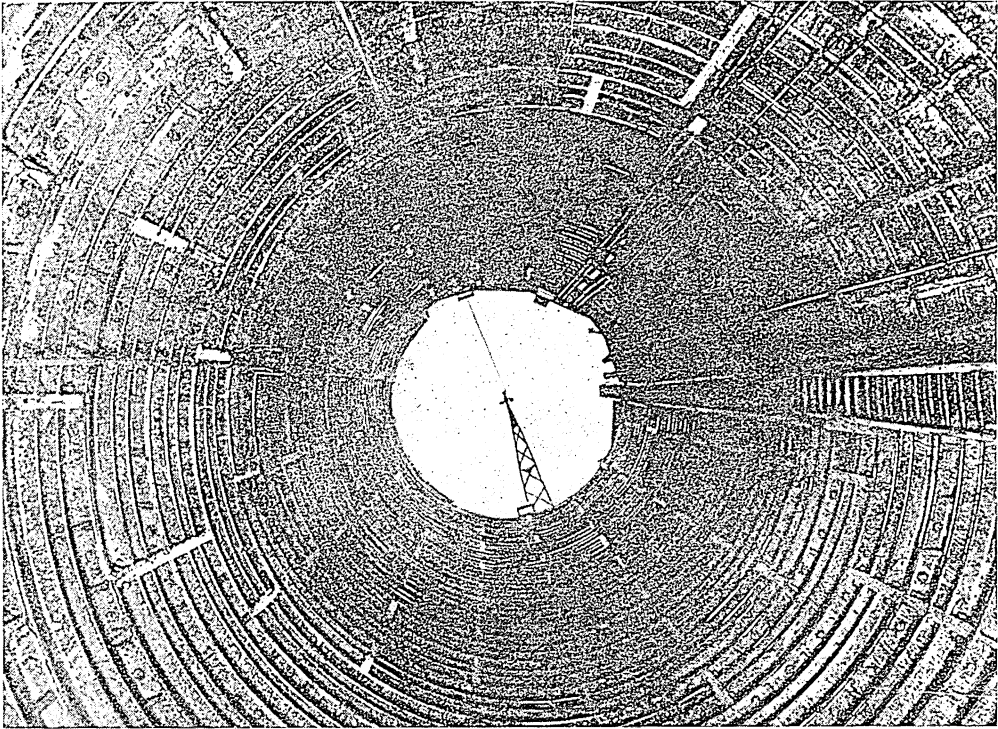


A shield was lowered into the shaft, and moved forward as men dug out the tunnel.

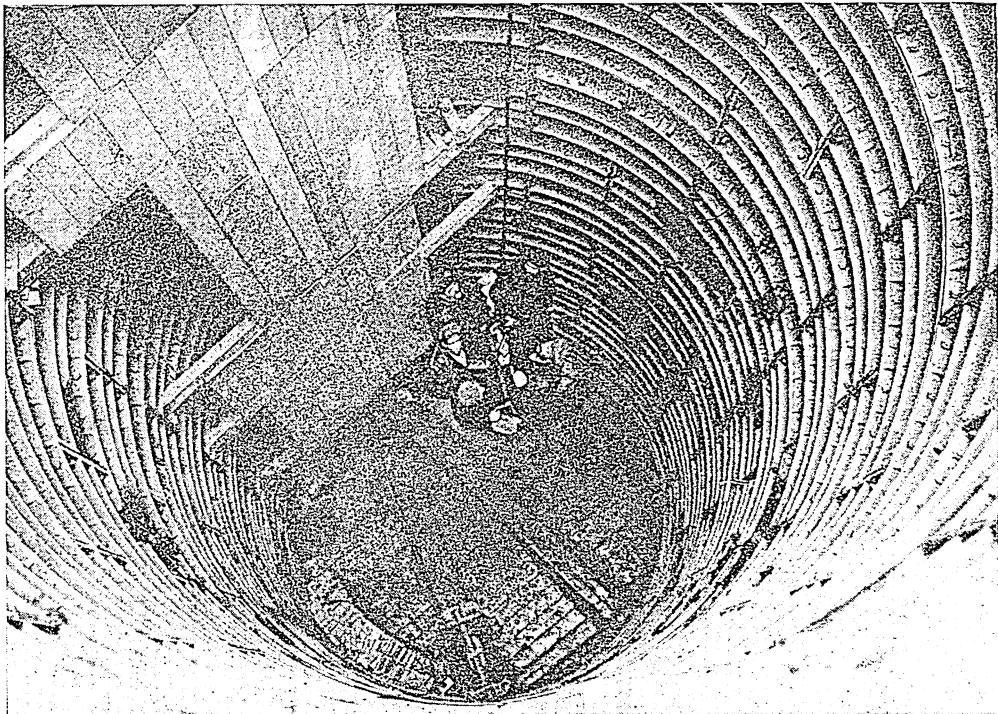


The difficulties were enormous, and several times the tunnel partially collapsed, as shown here, and the waters rushed in. But after seventeen years success crowned the great effort.

LOOKING UP AND DOWN A SHAFT

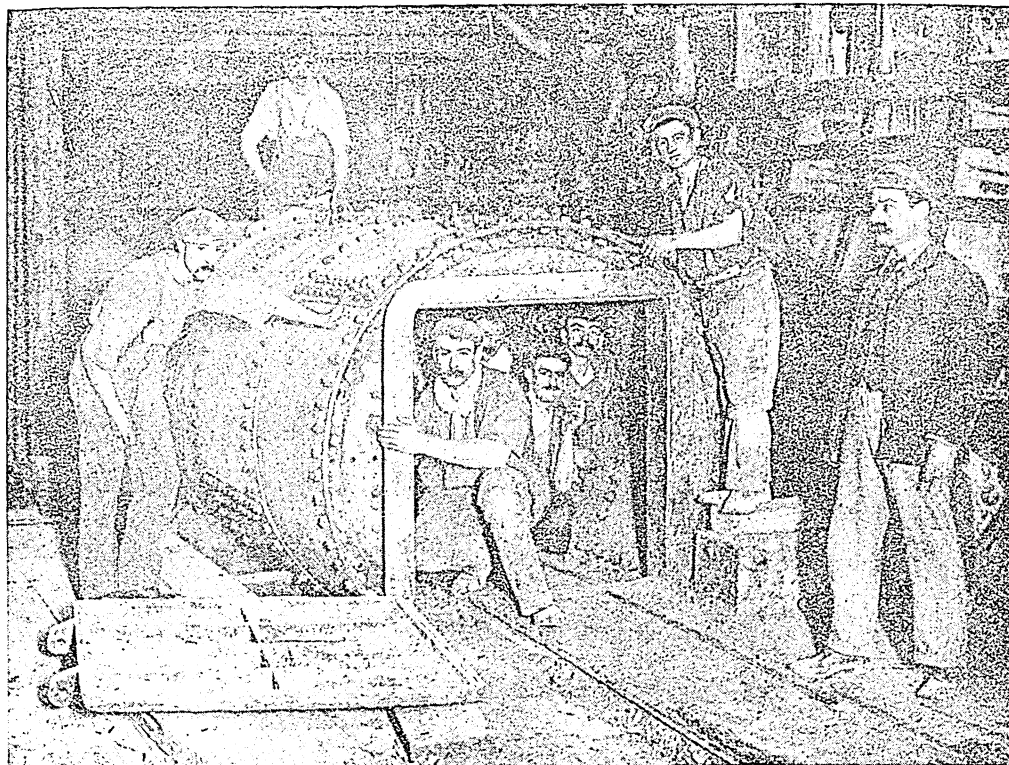


The first step in making a tunnel is to sink a shaft from which the burrowing out of the earth can be started. In this picture we are looking up a shaft sunk for the making of a London tube railway.

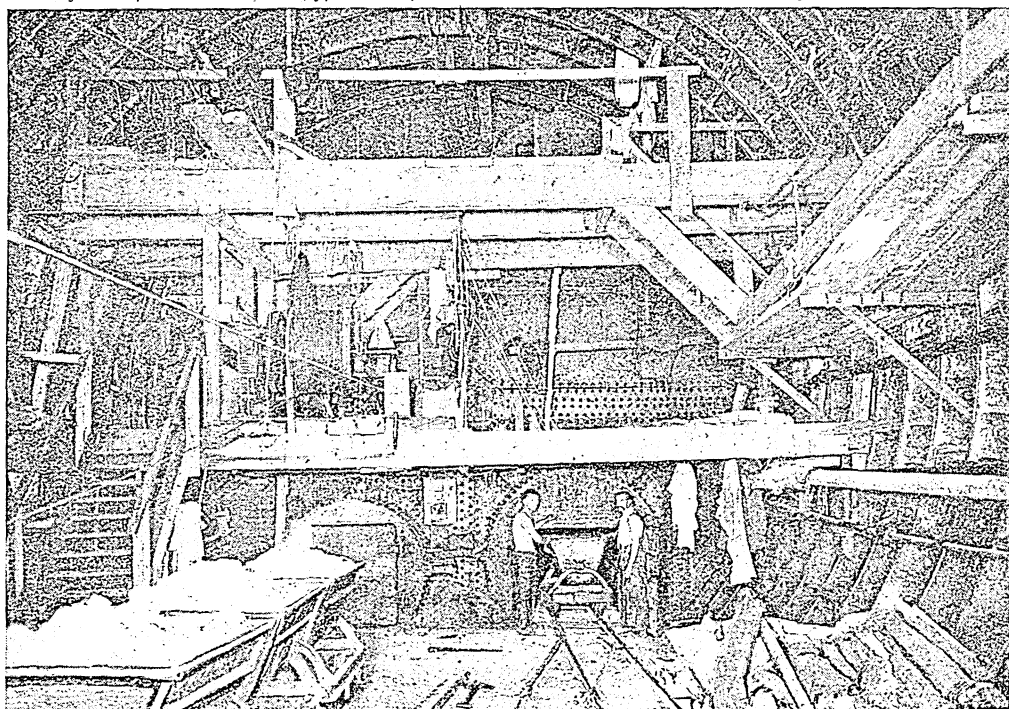


In this view we are looking down the shaft from the top, and can see a group of workmen being lowered by means of a cable and cage. This is part of the work of extending the Central London Railway to Liverpool Street.

THE AIR-LOCK IN A GREAT TUNNEL

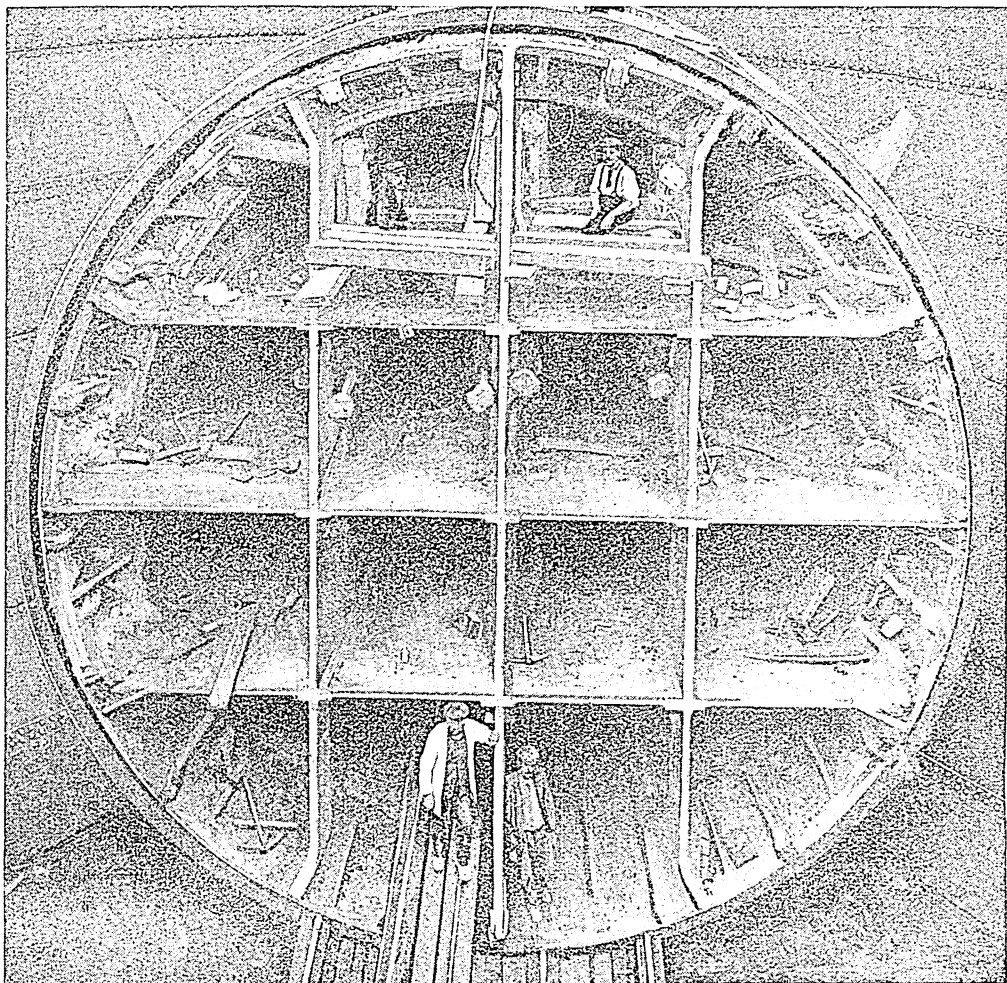


The men who make the tunnels have to work in compressed air, the pressure being greater than that of the ordinary atmosphere. It is necessary, therefore, to have air-locks, and these men are making an air-lock in a tunnel.

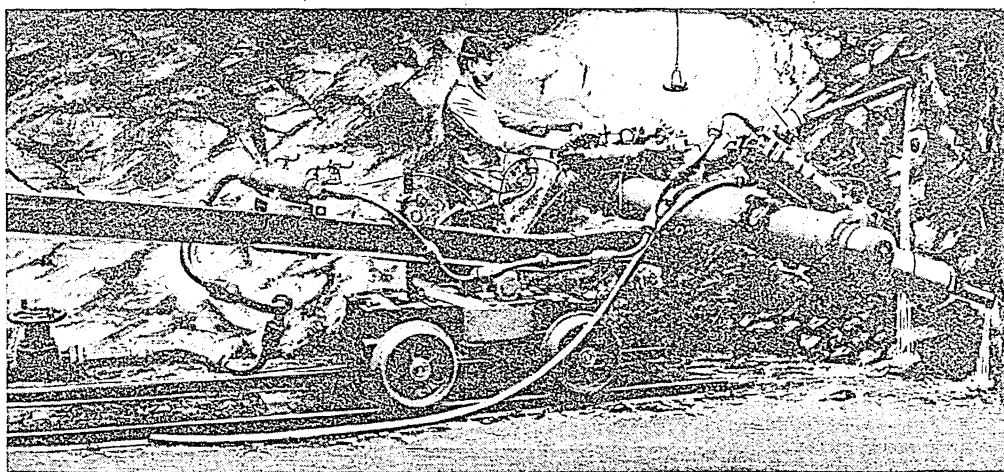


Just as the lock in a river enables the passage of boats from one level to another without unduly wasting the water of the higher level, so the air-lock enables trolleys, workmen, and so on, to pass into the tunnel without a great loss of compressed air. Here we see two air-locks side by side, one of them being open and the other closed.

THE SHIELD THAT PIERCES THE EARTH

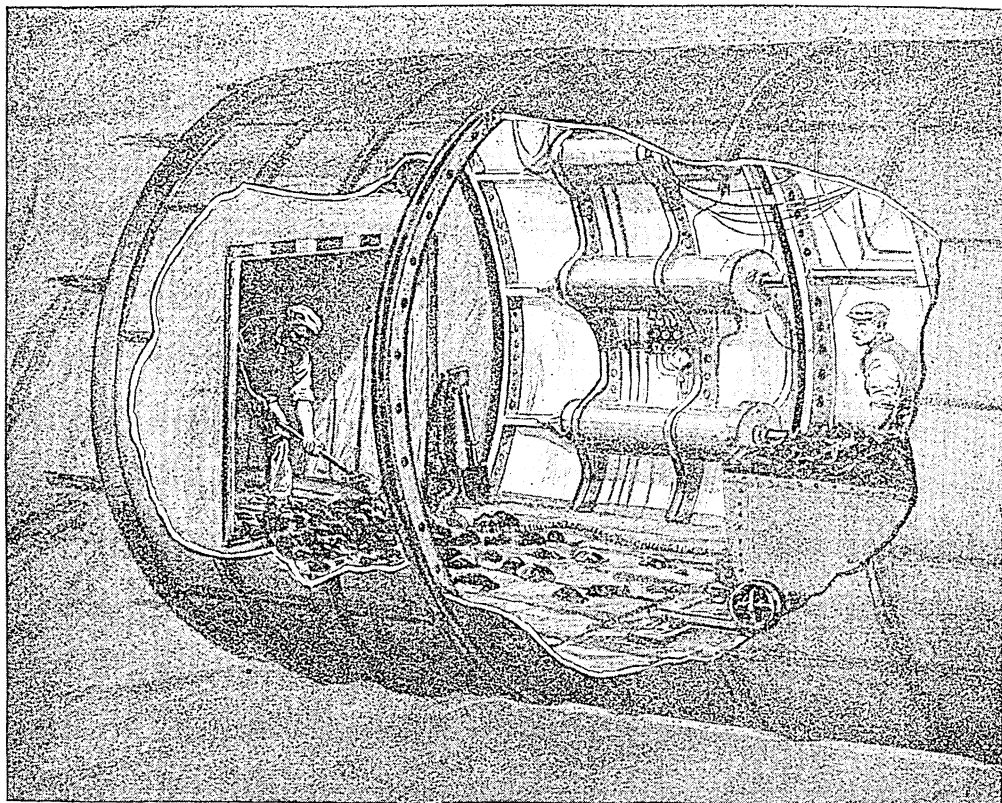


In digging out a tunnel a great shield is used, which is divided into compartments enabling many men to work at one time, and as the earth is excavated the shield is moved forward. This shield was used in making the Rotherhithe Tunnel under the Thames, and is a great improvement on Brunel's shield.

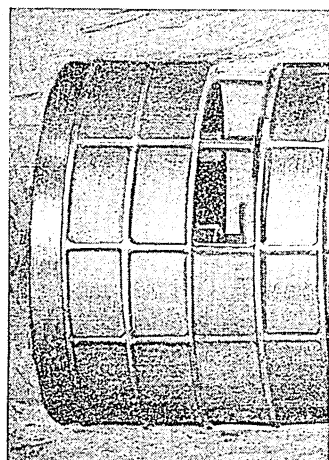
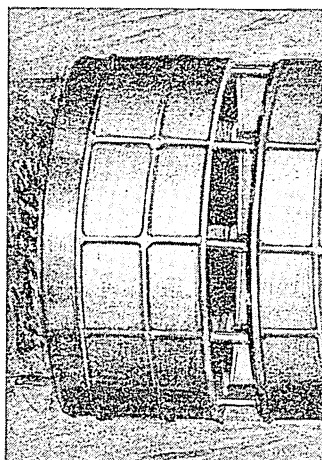
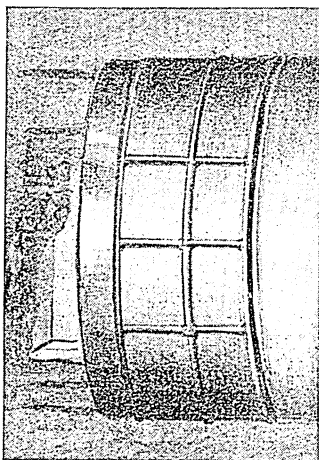


Where very hard rock has to be pierced, as in the Alps, exceedingly powerful drills are used, like the one shown here; the cutting tool is driven by hydraulic or pneumatic power.

THE MECHANICAL MOLE AT WORK

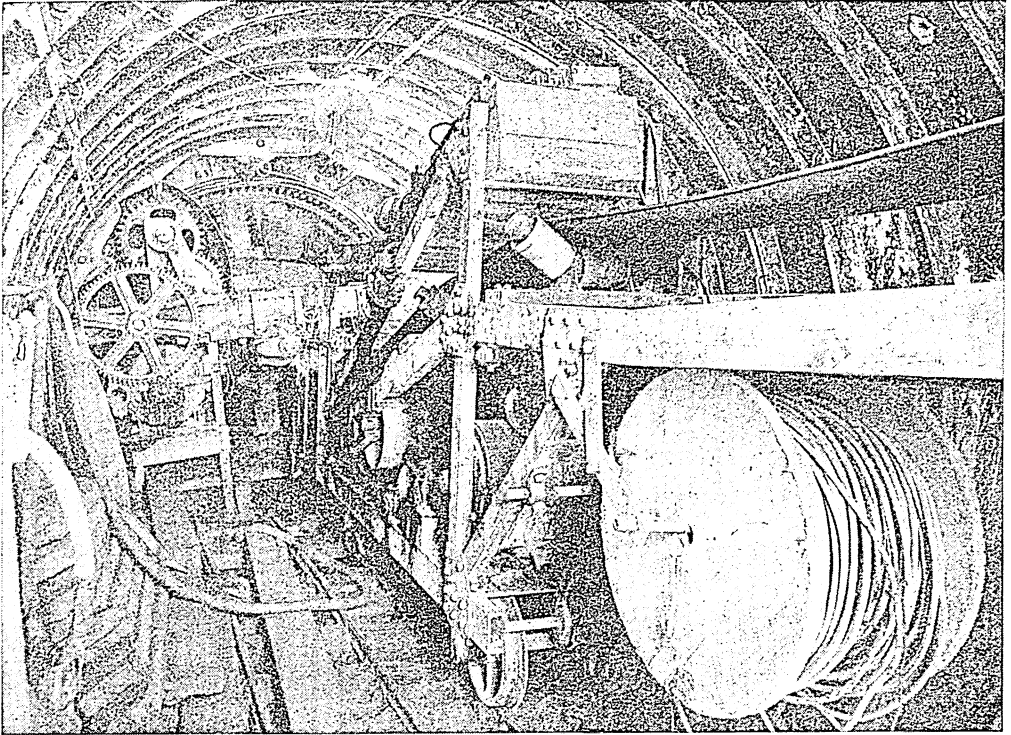


At work beneath London inside the wonderful Greathead Shield, a modern improvement of the shield invented by Brunel for building the Thames Tunnel, showing the powerful hydraulic rams which drive the shield forward. The shield is over twelve feet in diameter and six feet from back to front; and in twenty-four hours fifteen feet of tunnel can be driven

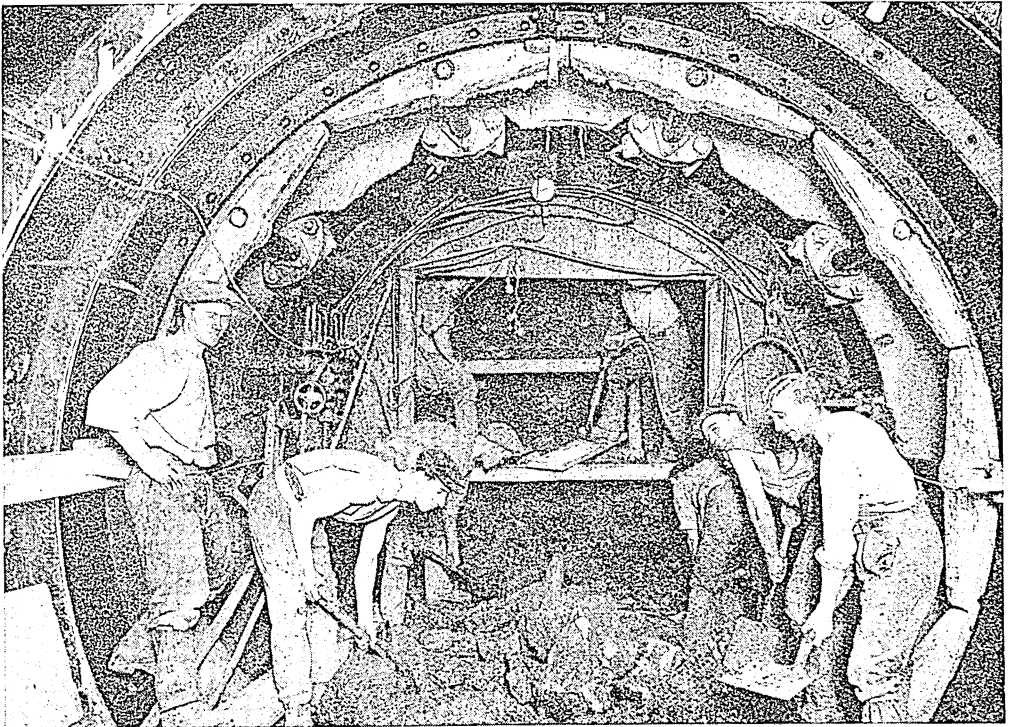


A little tunnel about six feet square, known as the heading, is cut into the clay in front of the shield with the aid of Ingersoll-Rand pneumatic shovels, and is then lined with wood, as seen in the first picture on this page. The shield is then pushed forward by great hydraulic rams, which exert a pressure equal to 1800 pounds for each square inch. These rams are attached to flanges resting against the last completed section of the tunnel, and a cutting edge in front of the shield bites into the clay. In the second picture the clay between the shield and the heading is seen collapsing, having been loosened by the wood props in front of the shield, and the wooden framework being unable to hold the great weight. This loose clay is then shovelled away by the men, as seen in the picture at the top of the page, and the new section of the tunnel is bolted into position, as shown in the last picture.

BORING A TUNNEL UNDER LONDON

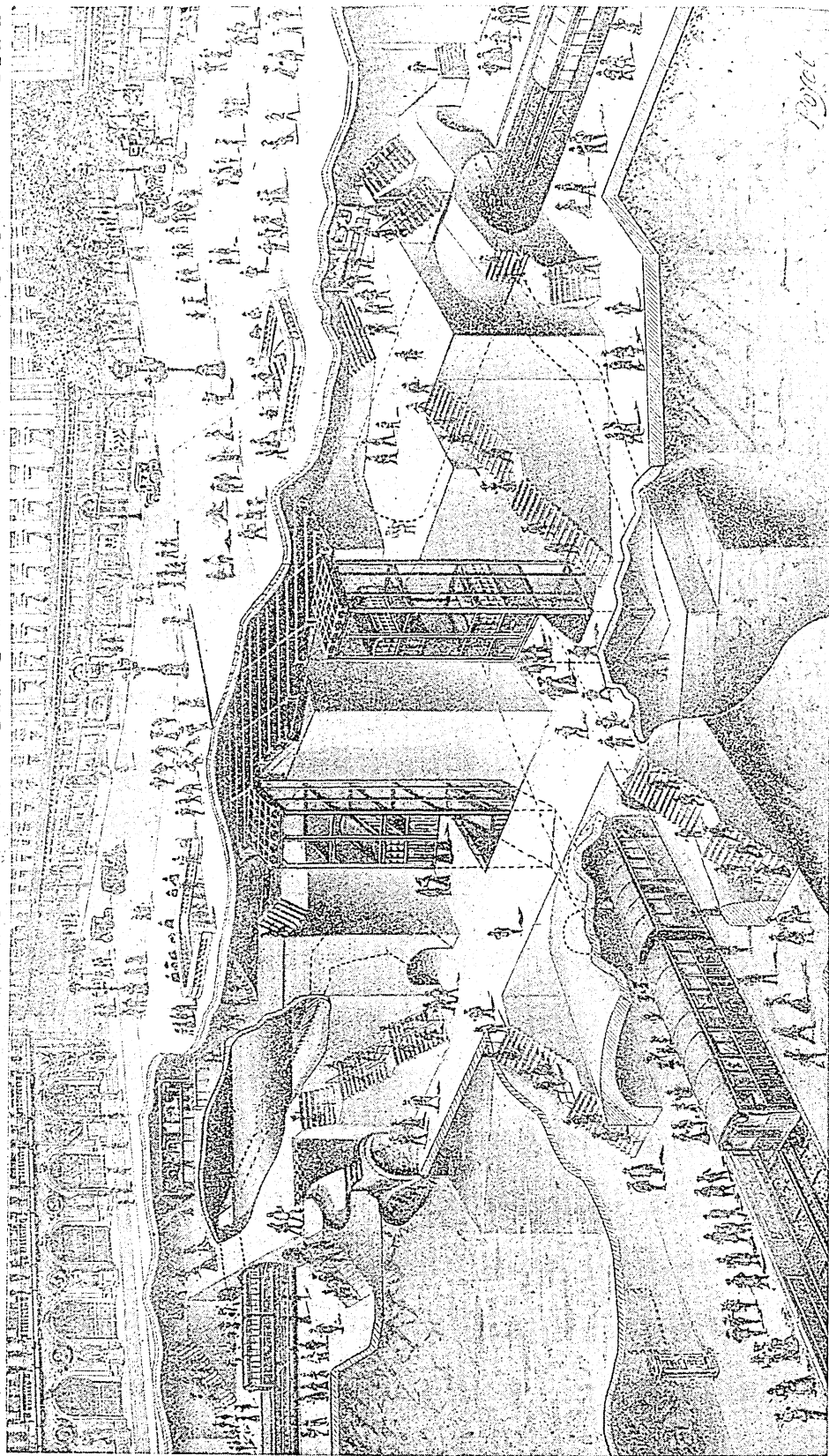


Various kinds of implements are used for the actual digging of the tunnel, and this is an excavator worked by electricity and used in making the Central London tube. The material dug out is brought away by an endless band.



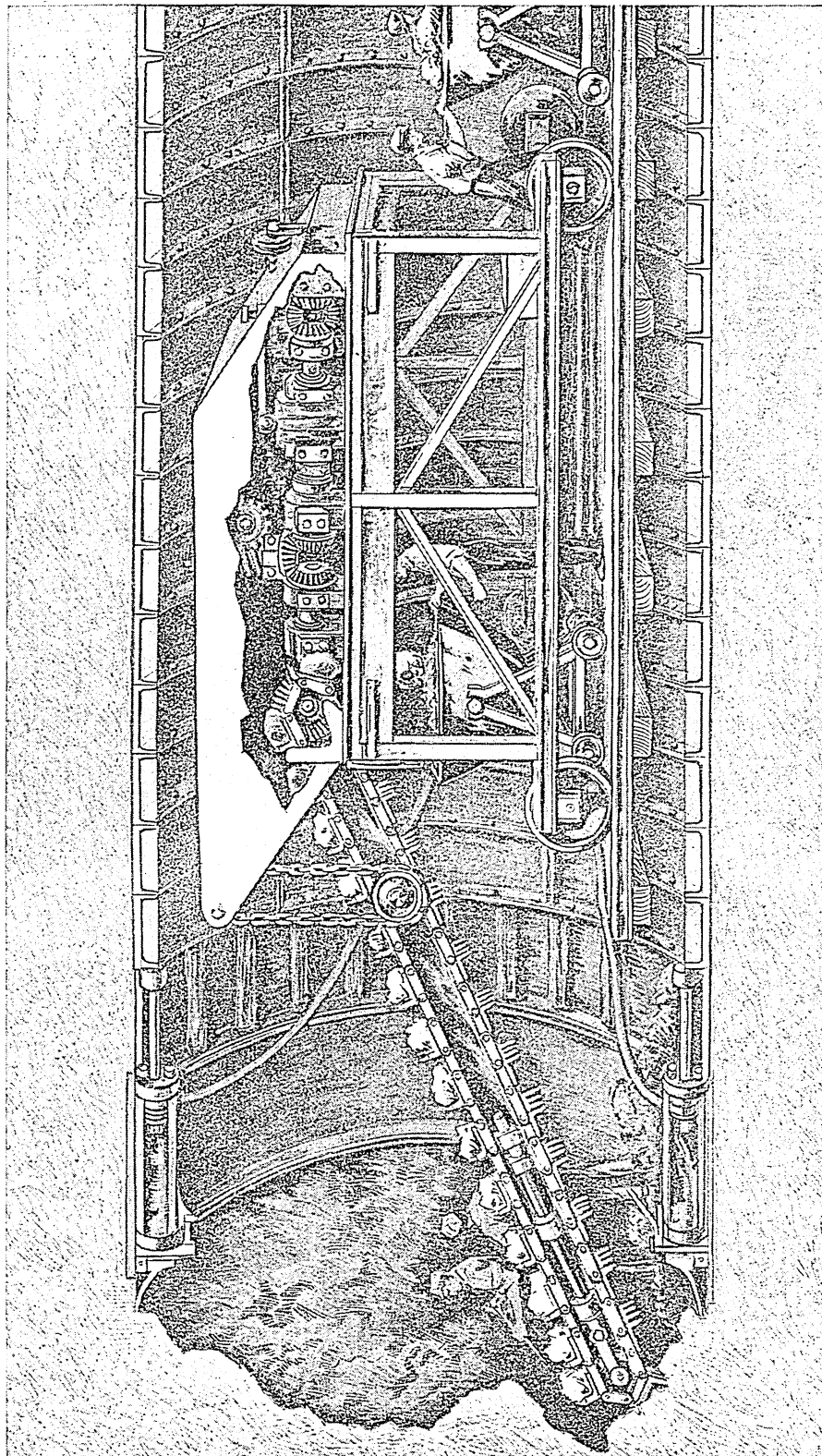
Whatever method of excavating is used, the material dug out has to be removed from where the shield is working, conveyed to the shaft, and raised to the surface. These men are digging away the earth that has been excavated

THE WONDERFUL HIGHWAYS THAT RUN UNDER THE STREETS OF THE CITY



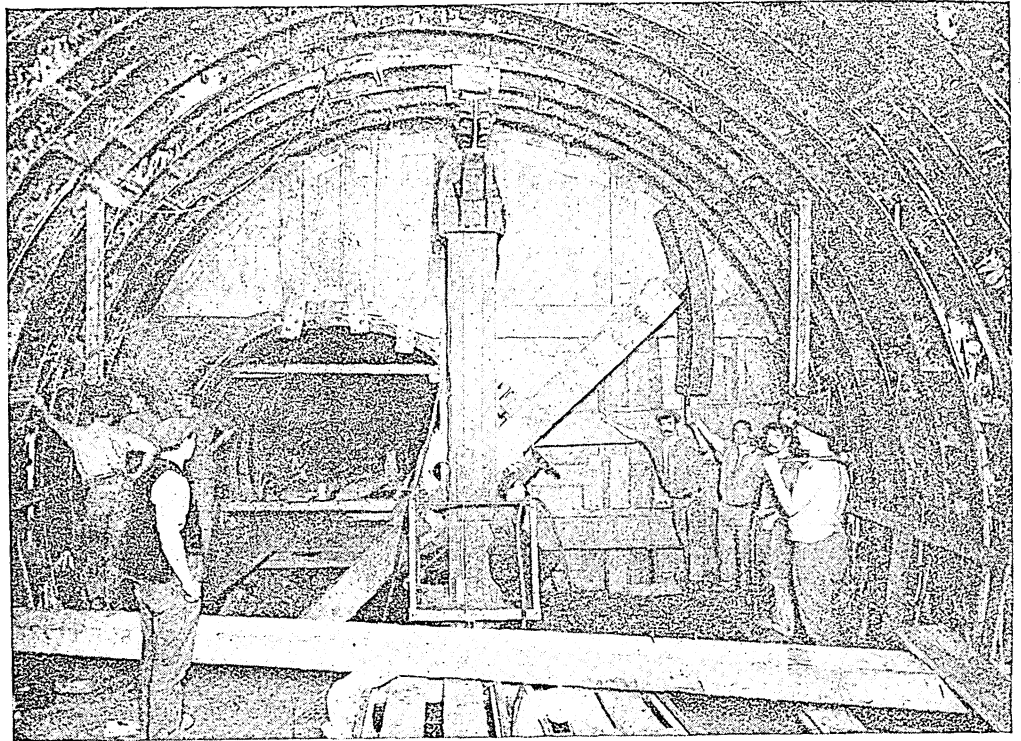
Great cities like London and New York and Paris now have a complex network of tunnels, crossing one another far below the level of the busy streets, in which run the trains that carry the people to and fro between their homes and their work. This picture shows Paris with the lid off, and we see the three railways that run underground in front of the Opera House.

THE ELECTRIC EXCAVATOR THAT DIGS ITS WAY THROUGH THE EARTH

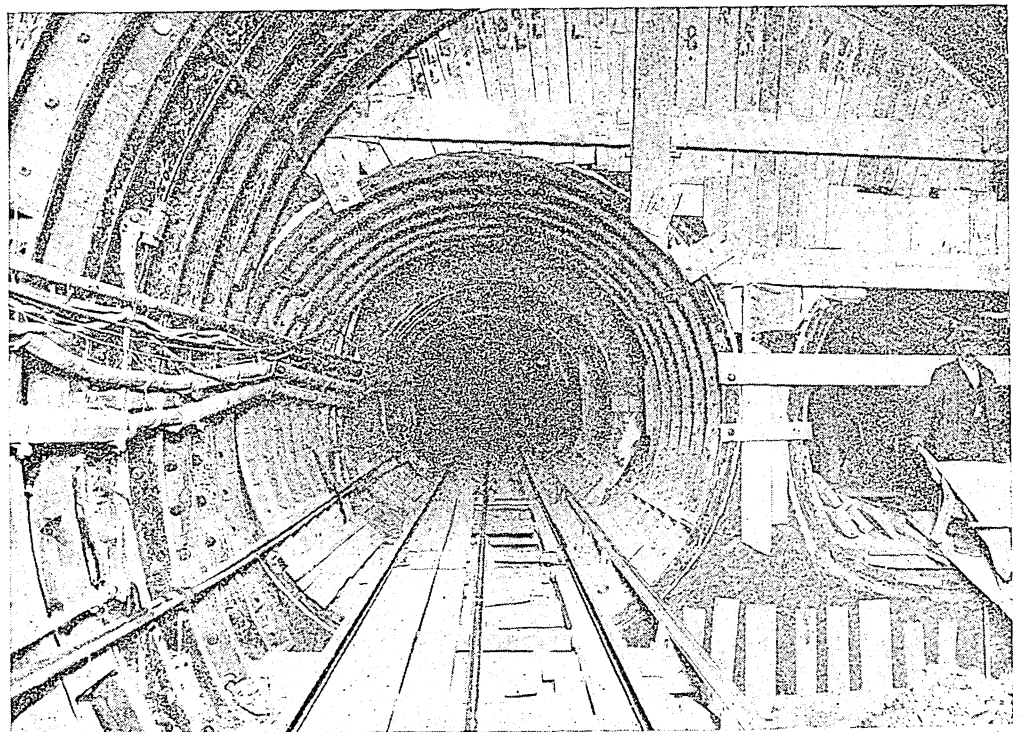


One of the most efficient methods of digging a tunnel, where the earth is comparatively soft, is by means of the Thompson Electric Excavator shown in this picture. An arm movable in all directions supports a chain of excavating buckets, which are able to reach any part of the face of the tunnel, and as the chain moves round and round the earth is scooped away and removed in trolleys. The carriage supporting the chain of buckets can be moved forward as required, and as the earth is dug out the shield is pushed forward.

FITTING THE STEEL RINGS TOGETHER

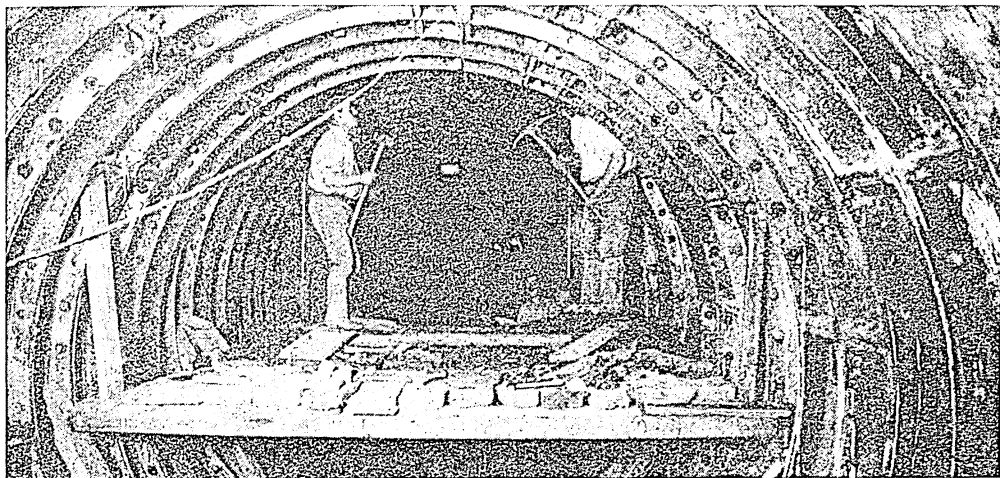


As the tunnel is dug out huge steel rings, or segments, are joined up one after another to form a tube and support the earth all round. The apparatus shown here is called an erector, and lifts the steel segments into position.

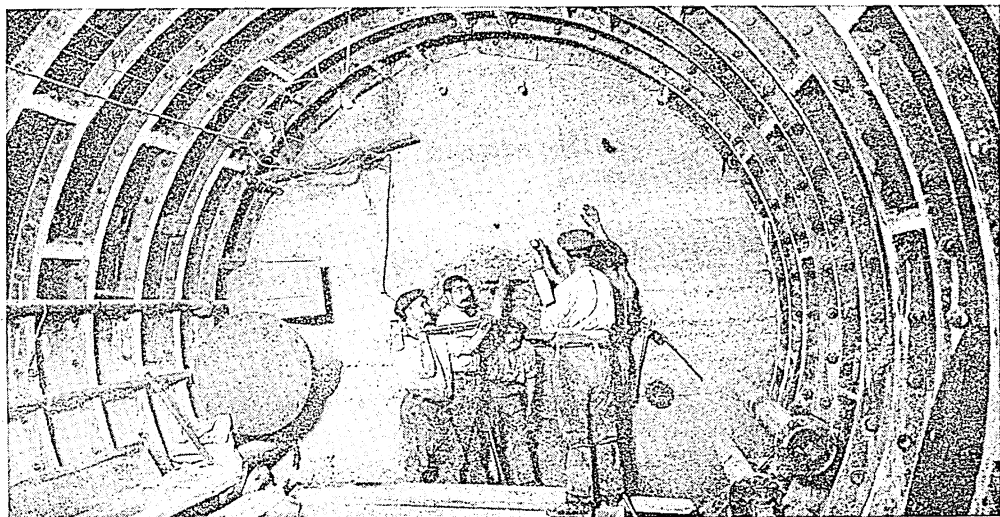


As great cities grow the need for increased railway facilities demands an extension of the tubes and underground tunnels. This picture shows a new tube being constructed by the side of an old one in London in order to improve the train service

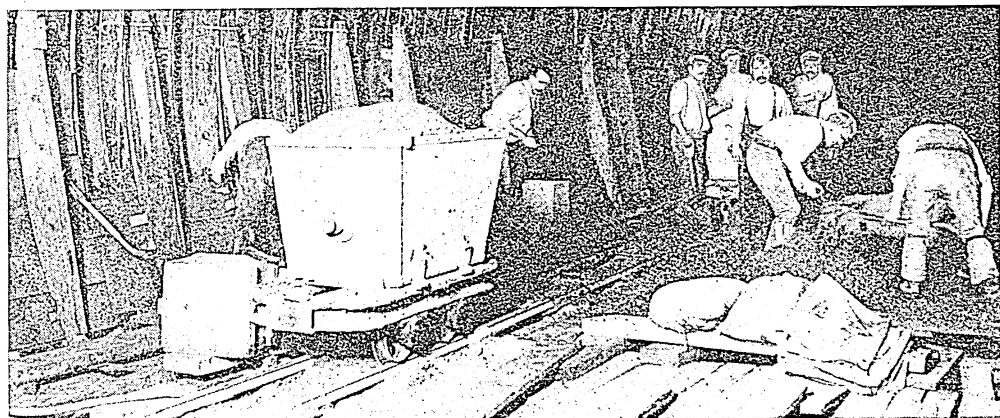
COMPLETING THE WALLS OF THE TUNNEL



These workmen are fitting in the last plates to form the walls of the Central London tube near the Bank of England. This work must be completed before the railway track can be laid ready for the trains.

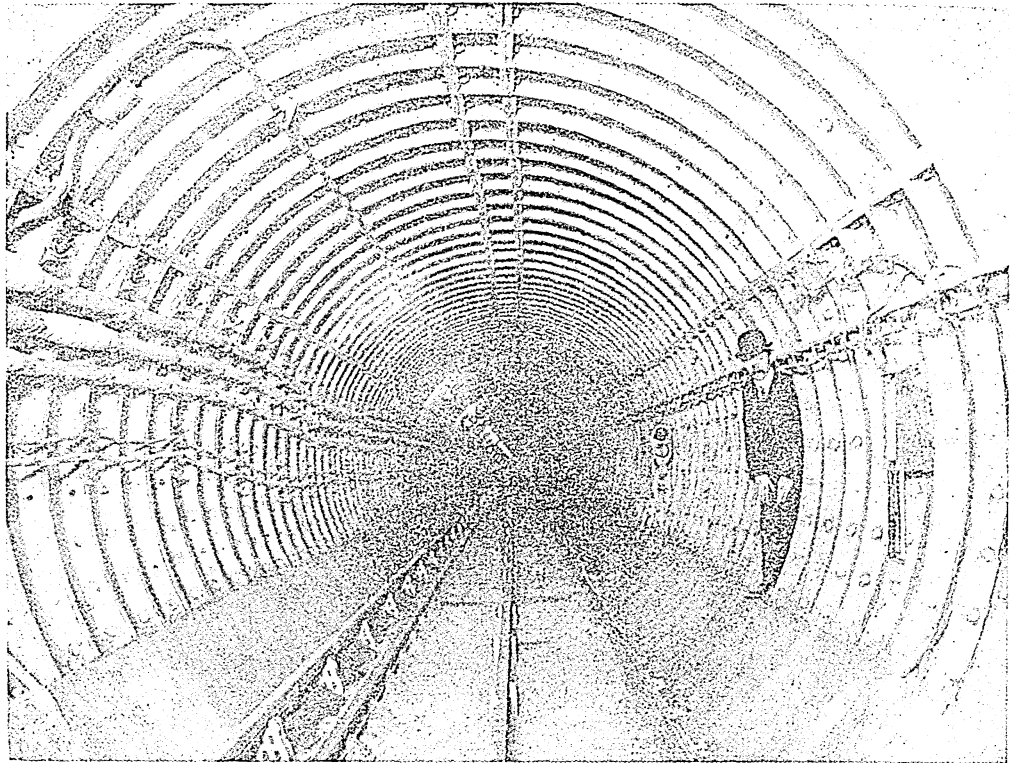


Here the men are removing a strong concrete wall erected across the tube to prevent the escape of compressed air from the workings. These walls are erected at various points, but are knocked down when the work in the section is finished.

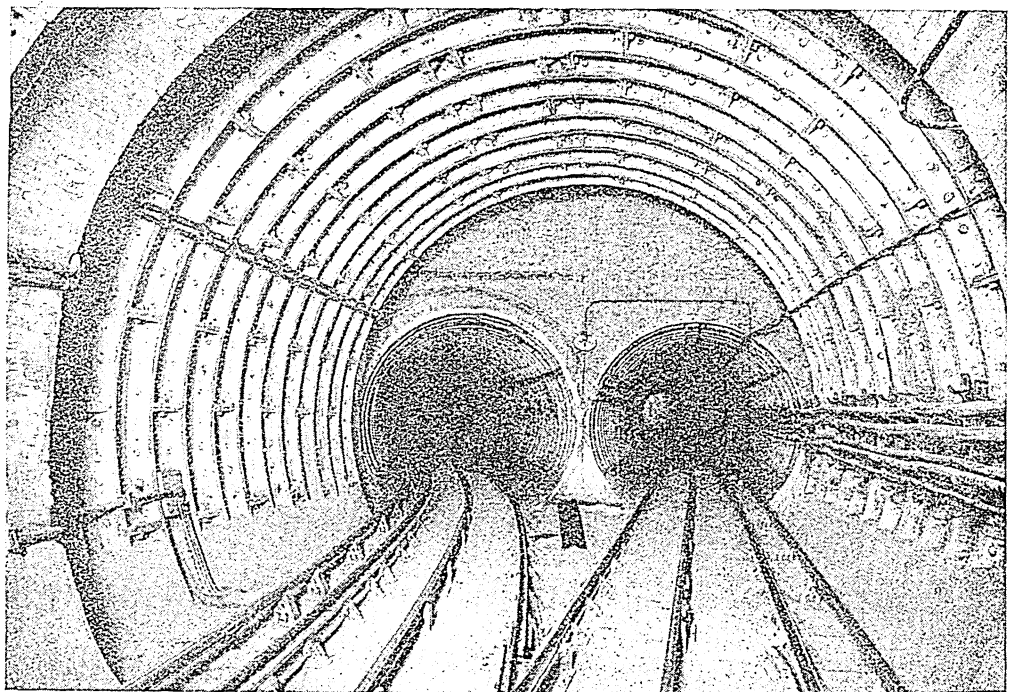


When the metal framework is completed the walls are not finished. These workmen are mixing cement at what is to be a station, and this will be placed between the girders to form the walls on which the glazed bricks can be fixed.

THE TUNNEL IS READY FOR THE TRAINS

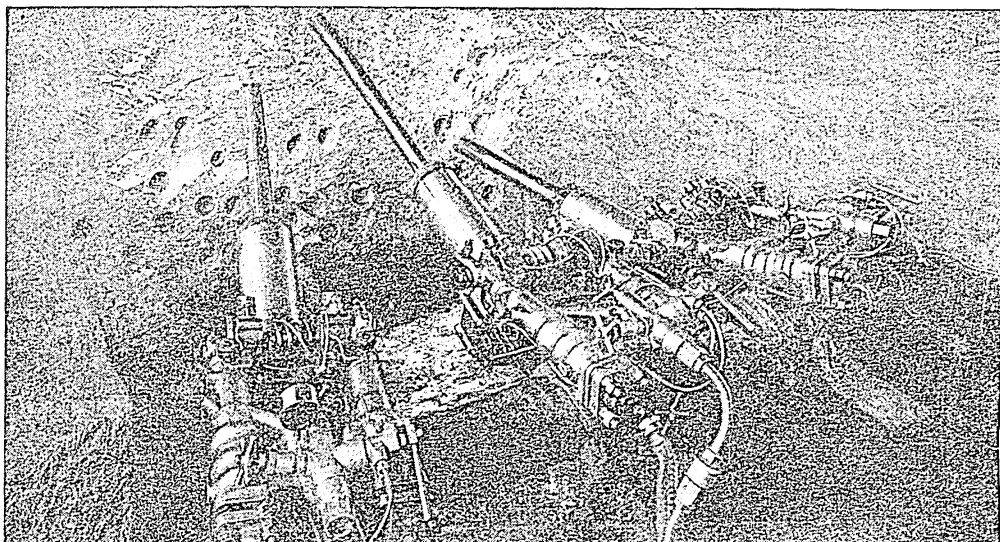


Unlike the original underground railway in London the modern tubes have only one line or rails each, the up and down trains running in different tunnels. As the space is so confined, the train almost fitting the tube, doorways occur at every hundred feet to enable workmen to pass from one tube into the other when trains are approaching.

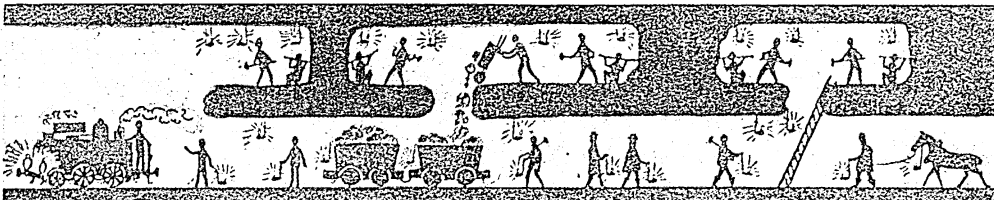


At certain parts on a tube railway there are cross-overs like that shown here, which is under Hyde Park Corner in London. These enable trains to pass from one tube to the other for the return journey or for any other purpose.

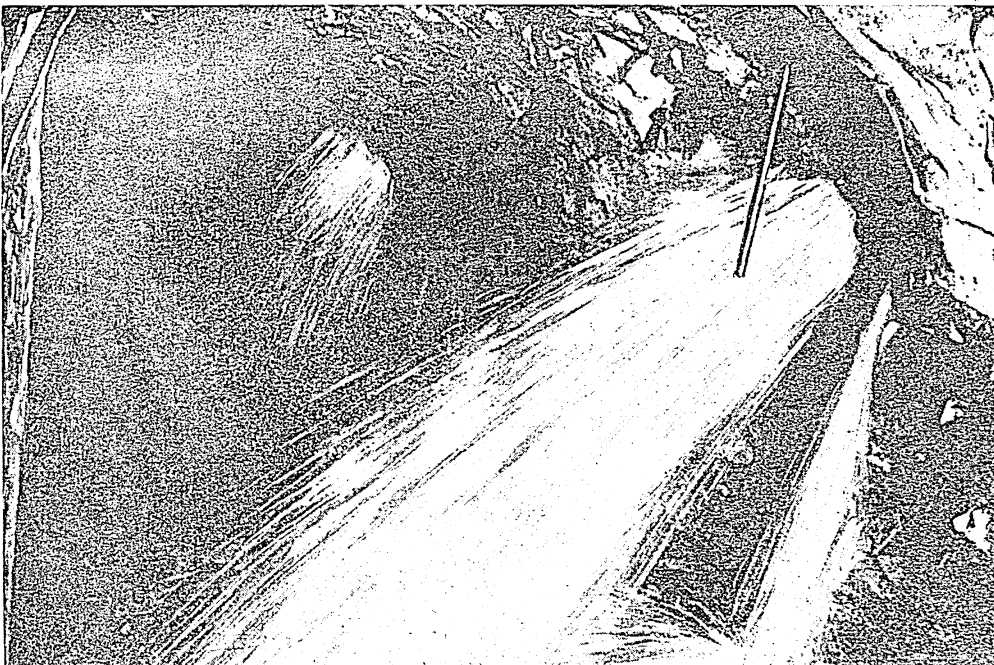
PIERCING A WAY THROUGH THE ALPS



The greatest example of tunnel-engineering was the cutting of the Simplon Tunnel through the Alps. This is twelve and a quarter miles long and is by far the longest railway tunnel in the world. These are some of the hydraulic drills that prepared the way for blasting a passage through the hard rock.



In making the Simplon Tunnel for a great part of its length two passages were excavated, as shown here, and then the dividing wall was removed. This plan rendered easier the ventilation of the tunnel and the removal of intruding water.

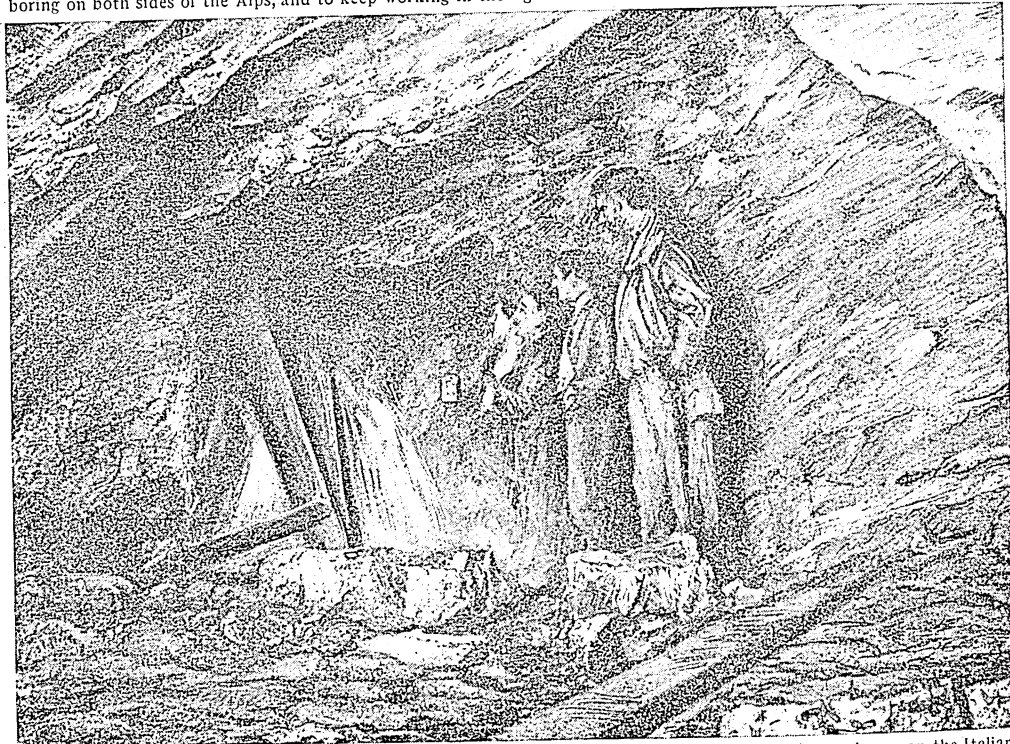


Many times springs, often of hot water, rushed into the tunnel like a torrent, and here we see a cold spring that was tapped and poured 12,000 gallons a minute into the workings. This caused a delay of several months.

A THRILLING MEETING INSIDE THE ALPS



By means of an instrument called a theodolite, which means "to see the way plainly," the workmen were able to start boring on both sides of the Alps, and to keep working in the right direction. Here the last wall of rock is being pierced.



This picture shows the most thrilling moment in the making of the Simplon Tunnel, when the workmen on the Italian side pierced the last barrier separating them from their Swiss comrades. It was literally a meeting inside the mountains.

Plain Answers to the Questions of the Children of the World



Edmund Burke at the trial of Warren Hastings

HOW DID MEN LEARN TO TALK?

ANYTHING that expresses to someone else what is going on in our minds is, in a way, a sort of talking. We can tell by a baby's face, long before it can talk, something of what it wants and feels. We can also tell by a baby's cry a great deal of what it wants and feels. Now, that cry is made with its voice, just as talking is made, and is really a sort of untaught talking. It is made in the same way, and it serves the same purpose. Different kinds of cries have different meanings. Then, also, we not only move our faces and make sounds with our voices, but we move our hands and arms. In some parts of the world these movements or gestures have definite meanings, and people can talk to each other in this way without saying a word. This is called "gesture language."

In the same way different kinds of sounds—and that is all words are in themselves—come to have special meanings of their own; and that is what happens when we talk. The simplest words are those which a baby will make all the world over when it first tries to talk. You only have to breathe out through your mouth and separate your lips twice to say *mamma*. This, or something very like it, is the baby's name for its mother in all languages, and

if men forgot how to talk the new babies would soon make a beginning with *mamma*. Is it not beautiful to think that language began in this way?

One of the interesting questions often asked about talking is why there are so many languages. It is worth thinking over. Very many words really begin in imitation of sounds. You know words like buzz, whirr, pop, and so on. People who study language know that far more words begin in this way than most people think. Apart from that, however, we often have to make words simply by inventing them. The word does not matter as long as everyone is agreed as to what it means. A word is only a name. You would still be you if you had been called Tom instead of Harry, or Monica instead of Marjorie. Shakespeare says in one of the best known passages in his plays:

What's in a name?

A rose by any other name would smell as sweet.

So in different parts of the world different names have been invented; but really different languages are a thousand times more alike than we think. Latin, Greek, Italian, Spanish, Portuguese, and French are really close relatives,

FIRE · WIND · WATER · LIFE · MIND · SLEEP : HOW · WHY · WHERE

because the different peoples who speak them are in large measure descended from the same people. So, nowadays, we can often learn the history of a nation by its language. English is probably the finest language in the world for all purposes, but it is a very funny mixture. This word mixture, for instance, is Latin, and so are tens of thousands of English words. Many others are a sort of French, and many others Anglo-Saxon, which is very like German. We say *father*, the Germans, *vater*, the Romans said *pater*, the French say *père*, and so on. All these words are really the same.

What Happens if an Irresistible Cannon Ball Hits an Immovable Post?

This is like many other questions that people puzzle themselves over, even quite grown-up people, who ought to know better; and a great deal of the quarrelling about things that go on in the world is due to people trying to answer questions like this, about which we might quarrel to the end of time without getting any farther. This is a question that cannot be answered, for the very good reason that it is a question that cannot be seriously asked by anyone who thinks. A wise man has said that one of the great things wisdom does for us is to teach us how to ask questions, and wisdom certainly teaches us not to ask silly questions like this. For do we not see that the irresistible cannon-ball and the immovable post cannot exist together? When we say *irresistible* cannon-ball, that is as good as to say that there is no post which can resist it. When we say *immovable* post, that is as good as to say that there is no cannon-ball which can knock it down. If either of these things exists, then the other cannot exist. And so, of course, there is no answer to the question what would happen if they existed together, for it is part of the very nature of each of them, as we describe it, that the other could not exist at the same time.

Why Have We Different Tastes in Eating?

We know that no two people look quite the same. Everyone's face is differently made from every other face. We know that when we take prints of the markings on people's fingers they always differ from one another. We have never yet found two finger-prints in different people that were quite the same. And, as people

differ in their faces and in their skins, so they differ in deeper things. No two brains are quite the same, and so no two people have quite the same tastes. But there are other reasons why people have different tastes in eating. Different people's bodies have different needs. One person's body may require a good deal of fat, and may be very capable of digesting fat, and so that person will like fat and oily things—which may be less good for another, who will like it less. Then, again, at different ages we have different food requirements. Children are very active, and since they are small, lose their heat quickly. They therefore require a large proportion of food to supply them with energy and heat. Perhaps the best of such foods is sugar, and that is the good reason why children and young people like sweets and sweet things more than most grown-up people do. This is not greed, but the demand of the body for what it specially needs. Thus tastes differ, too, in different parts of the world.

Why does Grass Turn Yellow After Being Made into Hay?

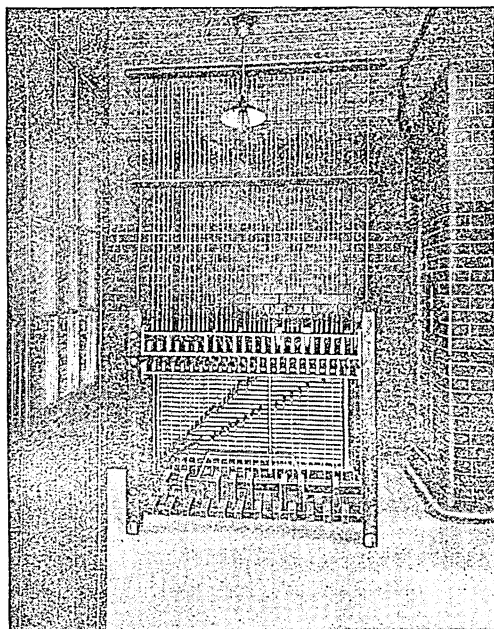
If there were no microbes in the world this would not happen; but nearly all the changes that happen in the bodies of living things after they die are due to microbes. This is as true of fish that turns bad as of grass that turns yellow when it is made into hay. Perhaps we are apt to forget that grass is part of the body of a living thing, but so it certainly is. It consists of those parts of certain plants which are called their leaves.

These leaves, like all other leaves, have the special duty of feeding on the carbon dioxide of the air by the aid of sunlight, and for this purpose they contain a very wonderful chemical substance called *chlorophyll*, the colour of which is green. Like all other chemical compounds which are very complicated, chlorophyll is very easily broken up and changed into something else. On the other hand, most simple compounds, like water, are very difficult to break up.

When the leaves of grass die by being cut, the very first compound that suffers from the change is this delicate and unstable chlorophyll. It is broken up into compounds, some of which have a yellow colour. We see the same thing in the leaves of a tree in autumn, which the tree has killed by corking up the channels through which they got their food.

How is a Carillon Worked ?

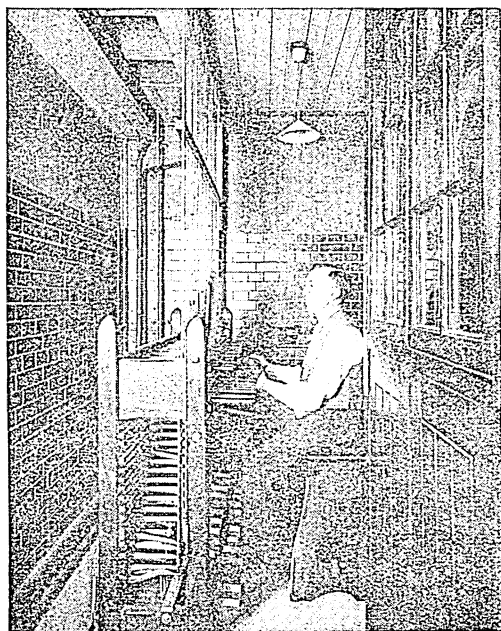
The carillon, as a peal of bells is called, from an old French word, is now becoming much better known in England, for half a dozen have been brought into use in the last few years. One is at Loughborough, and another at Bournville, the famous industrial village founded by Mr. George Cadbury. A carillon has been described as a series of bells so hung and arranged as to be capable of being played as a musical instrument, either by means of machinery, or by a keyboard. If the carillon is played by machinery the method is automatic, the same as that used for chimes on church bells; the tunes are set on a revolving barrel, which is driven by heavy weights,



run "every day for ever" in memory of the men who fell in the war, has 47. The most famous bell foundry in England, whether for church bells or carillons, is Taylor's, at Loughborough. Ages ago England was called the Ringing Isle, and though she has lost some of this distinction she has still about eighty thousand ringing bells.

Why does Everything Spin Round When We are Dizzy ?

When anyone feels dizzy and perhaps almost about to faint, his brain cannot properly control the working of his eyes. They may move round from side to side, perhaps independently instead of to-



THE KEYBOARD OF THE BOURNVILLE CARILLON

as in a grandfather's clock. But the carillon which is free to play any tune has stationary bells struck by hammers connected by wires to a keyboard, at which the player sits. The keyboard is also fitted with pedals for the lower notes, to be worked by the feet. The keys, which project, are struck with the closed hand, the little finger being protected with a leather covering. As the key has to move the weight of the clapper, the blow, especially for the lower notes, must be strong—hence the value of the pedals. Carillons may consist of from 35 to 49 bells. The Bournville carillon has 37, and the Loughborough carillon, which is to be

gether, and so it may look as if things were spinning round. Another reason for dizziness has to do with a wonderful part of the body near the ear, without which none of us could sit upright, much less stand, though few people have ever heard of it. This organ, which used to be thought to have something to do with hearing, really controls our balance. In some people it suffers from a disease, and these people constantly suffer from dizziness and an unpleasant feeling that everything is spinning round.

As every child knows, we can make ourselves dizzy by turning round ourselves several times in one direction. This disturbs

the organ of balance, about which we have been speaking, and this disturbance it is that gives us the feeling. If you turn round the other way you put things right by restoring the original state of affairs within the balancing organ. The name for the feeling that things are spinning round is *vertigo*; *vert* simply means *turn*.

Why Do Birds Cast Their Feathers ?

Feathers become worn and torn and broken, and must be replaced. We do not know how birds manage to moult their feathers; it is one of the wonderful provisions of Nature, whose effects we see without being able to say exactly how they are caused. But the moulting of birds is similar to what takes place in other forms of animal life. Horses grow long coats of hair in winter which they shed in summer. Dogs cast their coats. Snakes cast their skins; crabs and other shell-fish cast their shells. If a crab lived always in one shell his body could never grow any bigger. At a certain time in the year his flesh becomes very watery, so that he can draw those great claws of his through the narrow opening at the top of the shells in which they are enclosed, and he comes out of his shell almost as soft and pulpy as an egg in its skin with its shell removed. Birds are never left bare like this. They moult gradually. Yet some are so completely robbed of their strong feathers that they are glad to go into hiding until the new ones grow. They are then as defenceless as is the stag which has shed its mighty antlers.

Why is a Hat Called a Billycock ?

It was first called a Billy Coke, after the famous Billy Coke of Norfolk, who was the first Lord Leicester. He wore a hat of this kind about the beginning of the Victorian era, and it became associated with him, like Wellington boots with the Iron Duke, or as the brougham became associated with Lord Brougham.

What Makes the Sound in the Organ ?

When the organist puts his finger on a key, he allows air to enter the pipe that corresponds to the key he touches. The air is thrown into vibration in the pipe, and this spreads in all directions through the air and makes the sound we hear. It is really a vibrating column of air that produces the sound, while in the piano it is a vibrating string transferring its

vibrations to the air around it. So the organ is really a huge wind instrument, as the other is a stringed instrument. The rate at which the column of air vibrates decides the note we hear, and depends on the length of the column, which, of course depends on the length of the pipe. Thus, a pipe 32 feet long will hold a column of air that vibrates just half as fast as the column in a pipe 16 feet long, and the note of the longer pipe will be exactly an octave below the other. It would not do if there were nothing but a plain pipe, because, of course, the air would simply rush through it with a hiss. At one end of the pipe there must be something to throw it into vibrations, a "tongue," which may be made of various materials and shapes according to the *quality* of the note we want. But the *pitch* of the note is decided by the length of the pipe.

What is a Pyrrhic Victory ?

Pyrrhus, king of Epirus, when helping the Greeks against the Romans in Italy in 280 B.C., won two battles with such severe losses in killed and wounded that he was compelled to retreat into Sicily. Thus a victory won at a cost so great as to make it worthless is called a Pyrrhic victory.

Who is Chanticleer ?

The poetical name for a cock, derived from his clear crowing. The cock takes a prominent place in the medieval fables about animals, such as those in the ancient book Reynard the Fox. In these stories, Chanticleer shows himself daring enough to dupe Reynard, though the fox is famous for tricks. One day, Reynard, starving as usual, had slyly smuggled himself into a poultry yard and devoured the poor cock. Having eaten his full, he was slouching along when peasants came across his way and reproached the animal for his cruel mischief and cunning. Chanticleer heard the talk from where he languished, suffocating, in the stomach of the fox. "Why don't you answer these unjust accusations?" he whispered to his enemy, and, as the unwary Reynard opened his mouth, the other jumped out and escaped.

The French poet Edmond Rostand has made Chanticleer the chief character of a drama where all the actors play the parts of animals, a work whose popularity owes as much to the originality of the subject as to the lyrics of the poet.

Why is a Food Tin Generally Round ?

Round tins are easier to make than square tins, but the main reason for making them this shape is because it embodies the principle of the arch, which helps greatly in giving them strength. A round tin can stand a great deal of knocking about, and also a great deal of pressure, without losing its shape. It has no corners to become battered or dented.

Do All Things Move in Space ?

Of course, the Sun and the Moon, and even, as we now know, what used to be called the "fixed stars," have motions of their own—their *proper* motions, as they are called, proper really meaning "belonging to"; but the motion which proves that the Earth is moving is called their *apparent* motion, for it only seems or appears. The Earth is moving, and not they. The marks of this motion are that it is *common* to all the heavenly bodies, though their own or proper motions may all be quite different from each other; and that it is daily, or *diurnal*, which is Latin for daily. The best proof of the Earth's motion, then, is the *common, apparent, diurnal* motion of the heavenly bodies, which can only mean that the Earth spins right round on itself once a day; just as the best proof of a train's motion is the *common, apparent* motion of everything on both sides of it—common, or shared in by all objects, even though these may include cows or horses running in opposite directions to each other. That, of course, is their own or *proper* motion. Everything moves.

Why does Red Irritate a Bull ?

It is very difficult to be quite sure of the truth of this question, and we ought to be sure of the fact before we try to explain it. No one has made experiments to prove that red really irritates the bull more than any other bright colour. Still, it is probable that red, perhaps just because it is usually the brightest of colours, does irritate a bull; though if the red colour were on something that did not move, perhaps it would have much less effect. People have thought that bulls are irritated by red because it is the colour of blood; but we do not think that is so. A certain amount of study of human beings seems to suggest that different colours differ in their effect on the nervous system, and that while such colours as green and violet are soothing, yellow and red are exciting.

Of course, it takes very little to irritate a bull; only the saying is so popular, perhaps because it applies so well to ourselves. We are all apt to fire up at some particular subject, as the bull is supposed to do at a red rag.

Does a Bridge Expand in the Sun ?

A bridge expands in the sun or in the daytime or in the summer, and shrinks in the shade or at night or in winter. The rule is that heat makes everything expand, while cold makes everything shrink. Cold is not a thing, but the absence of heat; and so we may say that everything occupies more or less space according to the amount of heat in it—that is, of course, if other circumstances, such as the pressure round the thing, are kept the same. Metals have a striking way of changing their volume, or size, under the influence of heat, and so this change is very noticeable in the case of iron or steel bridges such as are built nowadays. If the engineer does not know that bridges expand in the sun, he will build a bridge that is certain soon to get strained, and even to crack. He has to reckon on the amount of expansion that will occur under the influence of such heat as the bridge is likely to be exposed to, and he must allow for it. In a big bridge like the Forth Bridge, many inches have to be allowed for its change of size when hot or cold.

How do We Know That the Earth is in Motion ?

We have in recent years found a new way of showing that the Earth is in motion—by setting something spinning, rather like a top, and showing that it seems to change the direction of its spin in a way which can only mean that the Earth on which it spins is itself spinning. But it was known that the Earth is in motion long before this way of showing it was found. Really we know that it is moving just as we know that even the smoothest train is moving—by the fact that other things seem to move beside it. In the case of the train these other things are the telegraph-posts and fields and hedges; in the case of the Earth the other things are the Sun and Moon and stars, and even comets, when there are comets to be seen. All the heavenly bodies seem to rise in the east and set in the west. It is impossible that this can mean anything else but that the Earth spins towards the Sun, Moon, and stars as they seem to rise, and away from them as they seem to set.

Why Does Smoke Always Come From a Fire?

There is no real reason why smoke should always come from a fire, and already there are many ways of making fires which produce no smoke. The time is not very far off when no one will be allowed to make fires that produce smoke. The reason why smoke comes from our ordinary fires is the same as the reason for a great many other facts that we can notice. It is, indeed, the reason which explains the making of the coal in the first place. Carbon will not burn unless it is hot enough, and it is less easily burned than most of the other things that can burn. So a certain quantity of carbon is apt to go unburned, though this will happen far less if we keep the fire hot enough, which is to be done by giving it a good supply of air. If we make a forced draught, and keep up a steady, quick flow of fresh air—that is to say, of fresh oxygen—to the fire, then we shall find that all the carbon is burned up, and no smoke will be produced. Smoke is always a sign of failure and waste, even if there were nothing worse to say about its consequences.

Why Cannot we See the Spokes of a Wheel When it Goes Very Fast?

The reason is that the marks made, so to speak, by anything on the retina at the back of the eye do not instantly fade away, but last for a small fraction of a second. The real marvel here is that these images on the retina last for such a short time, and that it is so quickly ready to receive new ones. Still, the images do last for a little while, and if a wheel goes round at all quickly, the marks made by the spokes at the different parts of their journey run into each other, and we see no distinct spokes at all, but only a faint blur inside the circle of the wheel. The first answer to this question that would naturally suggest itself to our minds is, that the spokes of the wheel cannot be seen when it turns quickly because they are moving too fast for the eye to catch. That, however, is not the case at all, and a simple experiment will show that the first explanation is the true one, and not this, likely though it sounds. If we set a wheel spinning in darkness, and then have a single flash of electric light just for an instant, we catch a glimpse of the spokes of the wheel all seeming fixed in one place, as if the wheel were not moving at all.

Why Does Glass Not Break if Put in Cold Water and Boiled?

Almost everything gets bigger, or *expands*, when it is made hot; and it gets smaller, or *contracts*, when made cool. If, then, we take a thing all in one piece, and do not heat every part of it to the same extent at the same time—something will have to go. That is what happens when a tumbler is cracked in the way we all know; but if the tumbler is put into water, and then the water is boiled, all the parts of the glass expand equally as it gets hotter. The *whole glass* becomes bigger, but there is no strain between the inside and the outside, and so there is no reason why it should break.

Why Is the Sky Blue?

This was found out last century by John Tyndall. You would never guess the reason. The sky gets its light from the Sun. When the Sun is away the sky is dark. Therefore, the blue of the sky must be somehow thrown to our eyes from something in the sky which keeps all the other colours in the white light of the Sun, and throws back the blue, and that is what happens.

The sky is filled with countless tiny specks of what we may call dust, specks of solid stuff hanging in the air. These are of just such a size that they catch the bigger waves of light, which make the other colours, but throw to our eyes the shorter waves of light, which make blue. If you could do away with all the solid stuff in the air, the sky would be dark, and all the light of the daytime would come directly from the Sun. Skylight is reflected sunlight, but only the blue part of it.

How Can a Duckling Swim Without Being Taught?

The answer is partly instinct. It is only fair to remember that in any case it is much easier for animals to swim than it is for us; and it is also fair to us to remember that some people do swim almost without being taught. Sometimes an insect, which has never seen anyone do the thing it has to do, does it perfectly; but in the case of the higher animals, like the cat and the duckling, the question of being taught comes in. The kitten may partly learn to purr through hearing its mother purr, and the duckling, though perhaps its mother does not actually teach it anything, gets confidence from its mother. It knows she is there, and it sees that she can swim, and that helps it.

The Story of the Beautiful Things in the Treasure-House of the World



St. John's College, Cambridge

INIGO JONES AND CHRISTOPHER WREN

THE Gothic period in England produced an architecture that was, if not entirely religious, much more suited to cathedrals and churches than any other kind of building. It was also a peculiarly finished architecture. Cathedrals of the medieval period and also those set up in the later Gothic style expressed in themselves a completeness of ideal and workmanship that has left them isolated in the history of English architecture. Later builders, working in the Gothic manner, could but look back and imitate.

One might therefore say that the Englishman's church came to life fully grown. It is extremely interesting to see, in contrast, how many centuries were passed in perfecting the Englishman's house. The "stately homes of England" took some centuries to grow.

Feudal times developed the castle—the Englishman's first stately home. It was more a fortress than a house, and not very comfortable to live in. The earliest castles, in Saxon times, were very rude indeed; we should think we were poorly housed if we had to live in them now. William the Conqueror introduced certain Norman styles, such as the square keep or chief tower of the castle, like the White Tower in the Tower of London. It was four storeys high, and when the lord of the

castle was at home he lived in the great hall of the keep, generally on the third storey, and the lord's withdrawing room, called the solar, was on the floor above.

The Tower of London, the castles of Windsor, Pontefract, Berkeley, Carisbrooke, Colchester, bear the mark of the twelfth-century Norman influence.

A hundred years later the castle became a little more human, less blankly fortress-like. The Great Hall of the Norman keep had served as dining-room, bedroom, and sometimes kitchen. Now, we find rooms were built for guests in a sheltered part of the castle. Stokesay, Shropshire, is a good example of thirteenth-century taste in the matter of castles. Another hundred years and we get developments like those which altered Kenilworth Castle, gave it a banqueting hall and kitchens and other rooms. In the reigns of Henry the Eighth and Elizabeth, Kenilworth was further added to. Warwick Castle, and Warkworth, Northumberland, are most interesting specimens of these early domestic fortresses. One of the last to be developed, and on very fine lines, is Tattershall Castle in Lincolnshire. A number of castles rose in Scotland, well built, memorable. The best known is Glamis, in Forfarshire. In Dublin the style of this period is recalled by Howth Castle.

PICTURES · STATUES · CARVINGS · BUILDINGS · IVORIES · CRAFTS

It is because castles like Kenilworth are for ever associated with romance that we regard this early type of the English dwelling as such a fascinating picture in the English story. Even the Tower of London, the greatest fortress of medieval times, has become something in a fairy tale. We forget how grim these buildings were, what death was dealt from their walls. We look at their ivy-grown battlements, and forget the quicklime and hot tar poured down on enemy ranks. But one thing we must remember, that this early architecture was of a magnificent kind.

WHAT THE ENGLISH MANOR HOUSE OF OLDEN TIMES WAS LIKE

We need only look again at the Tower of London, where we can learn so many interesting lessons, and notice some of the gateways, the fireplaces, the staircases, and ceilings. With the need for fortress-homes went this massive dignity of construction. We have not touched anything like it since.

The castle gave place, as social conditions changed, to the manor house. Here we get a little bit nearer to the stately homes of England. And we get also a glimpse of another kind of life which can never recur. The early manor house was like a little village. The house itself was grouped round a large hall which had a fireplace and was generally backed by the kitchen, which also had a fireplace. In all the house no other fires were possible. From this central hall ran out, right and left, the rest of the house, rooms opening into each other, upstairs generally branching out from an open gallery that looked down into the hall.

The floors were of uneven timbers and very often looked (and felt) more like a ploughed field than a floor. The house was of stone or sometimes brick. The windows were very small, and in the earliest period were merely shuttered; later came those leaded casements which we are so fond of putting into new country cottages built on old lines.

THE SLOW PROGRESS FROM THE FORTIFIED DWELLING TO THE HOME AS WE KNOW IT

Around the manor house were built, very well and solidly, and with the beauty that comes of leisurely work done by workmen who loved and took a pride in their labours, the various smaller places without which the manor house in those distant days could not have been upheld. There were the dairy, bakehouse, brew-house, smith's house, wash-house, coach-

house, granaries, the dwellings of the manor's retainers. There was nearly always a private chapel somewhere in the manor's precincts.

The architecture of these early manor houses was very severe. In Norman times (the building was much simpler then) a fortress-like wall surrounded the house, with a protected gateway. There was often a moat and consequently a draw-bridge. For many generations the chief interest in the manor house was the great hall which was the centre of the family life. As the various periods go by they are marked by ceilings, fireplaces, windows, staircases. The greatest art was spent on the main hall.

It is curious to note that only after centuries of development did the instinct for privacy show itself, and alter, as a matter of course, the architecture. In medieval times people lived "all of a heap." It was a great advancement when the "lady's bower" was arranged for, when rooms were built that did not open out of each other in a chain.

As the need for fortification or self-protection ceased, the manor house spread itself out more, had courtyards and wings, summer and winter parlours, and a great many private rooms. And thus we come to that interesting period of houses when wealthy trading families could have fine homes like Crosby Hall in Bishopsgate, now rebuilt in part at Chelsea.

THE GREAT PALACE CARDINAL WOLSEY BUILT BY THE THAMES

In the meantime we note these among the manor houses of the old order, remembering that in the passage of centuries many alterations and additions have been necessary: Little Wenham Hall in Suffolk; Penshurst Place and Ightham Mote in Kent, Sutton Courtenay in Berkshire, Great Chalford Manor House in Wiltshire, and Had-don Hall in Derbyshire.

These manors are among those whose foundations were in Norman and Gothic years. Several were built on the wane of the Gothic period, in the early Tudor reigns, such as Athelhampton Hall in Dorset, Bramhall Hall in Cheshire, Speke Hall in Lancashire, and Compton Wynyates in Warwickshire.

The reign of Henry the Eighth saw the last great building set up in England before the echoes of the Italian Renaissance upset the architects of Elizabeth's reign. This is Hampton Court Palace,

built by Cardinal Wolsey for himself, and liked so much by Great Harry that the Cardinal thought it tactful to make his master a present of it. The king made certain additions, and Wren, of whom we shall presently be thinking, found it necessary to pull down the east part and rebuild it in Renaissance style. Wren also planned the magnificent avenue approach through Bushey Park.

WHAT WE HAVE LOST IN DOMESTIC ARCHITECTURE SINCE TUDOR TIMES

The interest of the palace, and that which makes it "Hampton Court" to English people, is the original Tudor building, erected in the style that had developed by way of the English manor house, and lightly touched, flavoured, so to speak, by the work of the Italian craftsmen Wolsey drew in.

The old brick is gold-red with age, and the famous Clock Court, built by the Cardinal, in a diaper patterned brickwork, with battlemented parapets and delightful Tudor chimneys, is one of our eternal treasures. In the Clock Court we see the square-headed windows, the low, graceful mullions, the fine oriel of the gatehouse, and recognise what early Tudor domestic architecture, born of English Gothic, means. Cardinal Wolsey brought in Italian sculptors for the palace's adorning, chief among them Giovanni da Majano, who added the medallions of the Roman Emperors that strike such an interesting note, give a sense of history, of remoteness to this most English of buildings.

The great hall of the palace is one of the finest in Europe. Its hammer-beam roof, with that of Westminster Hall, built centuries earlier, and that of the Middle Temple Hall, London, built a little later, form some of our grandest souvenirs of a bygone genius in workmanship.

HOW THE HOUSES OF ELIZABETH'S REIGN "FELL FROM GRACE"

The houses built in Elizabeth's reign were of a different character, in a way had fallen from grace, were of a confused style, over ornamented, decorated with Italian details regardless of suitability by the German and Flemish workmen who were in England in great numbers at the time. In architectural history these years, between the Gothic and the Renaissance, are termed the Tudor chaos. The half-timber constructions, the gables, the quaintnesses will always be interesting, even if the façades show too many curls and twists.

The interiors of the Elizabethan houses were very richly carved and planned. The great hall was still so much the core of the building as to draw to itself all that was most lovely in the work of the time—in panelling, fireplaces, windows, open-beamed, carved roofs. Great staircases and the "long gallery" became notable features of the Elizabeth mansion. Outwardly, in plan, the E-shaped formation appeared, as if a quadrangle had been cut in half to let in sunlight and air.

Little Moreton Hall in Cheshire, Long-leat House in Wiltshire, Burghley House in Northamptonshire, and Sizergh Castle in Westmorland, are four characteristic houses in a reign that produced a great many. As the Elizabethan period slid on into the Jacobean, and the Renaissance influence became more strongly felt, another great company was added to our stately, if in some cases inartistic, homes: mansions like Audley End in Essex, Knole House in Kent, Hatfield House in Herts, Bickling Hall in Norfolk, and Holland House in Kensington.

THE DREAMING SPIRES AND TOWERS OF OUR UNIVERSITIES

Magnificent buildings of a public nature rose in England during the Gothic years and the early Renaissance period. They lie on that side the great dividing line made by the Renaissance, and they form a grand monument to our "middle years." Most of the colleges and chapels of Oxford and Cambridge, the main parts of the Inns of Court, London, the guildhalls, schools, hospitals, almshouses, bedehouses—how can we count up even fragments of our wealth without making it appear just a row of names and ourselves most unworthy inheritors of the past?

Visions of great beauty come to us with the mention of it—the spires and towers of the University towns dreaming by their lawns and rivers, King's College Chapel, Cambridge, Eton College, Winchester. Whatever there was of good in English architecture was reflected in the growing universities as the centuries went by. The early Renaissance left, in addition to important buildings, one or two exquisite touches like the Gate of Honour, Caius College, Cambridge, and the tower of the Bodleian, Oxford.

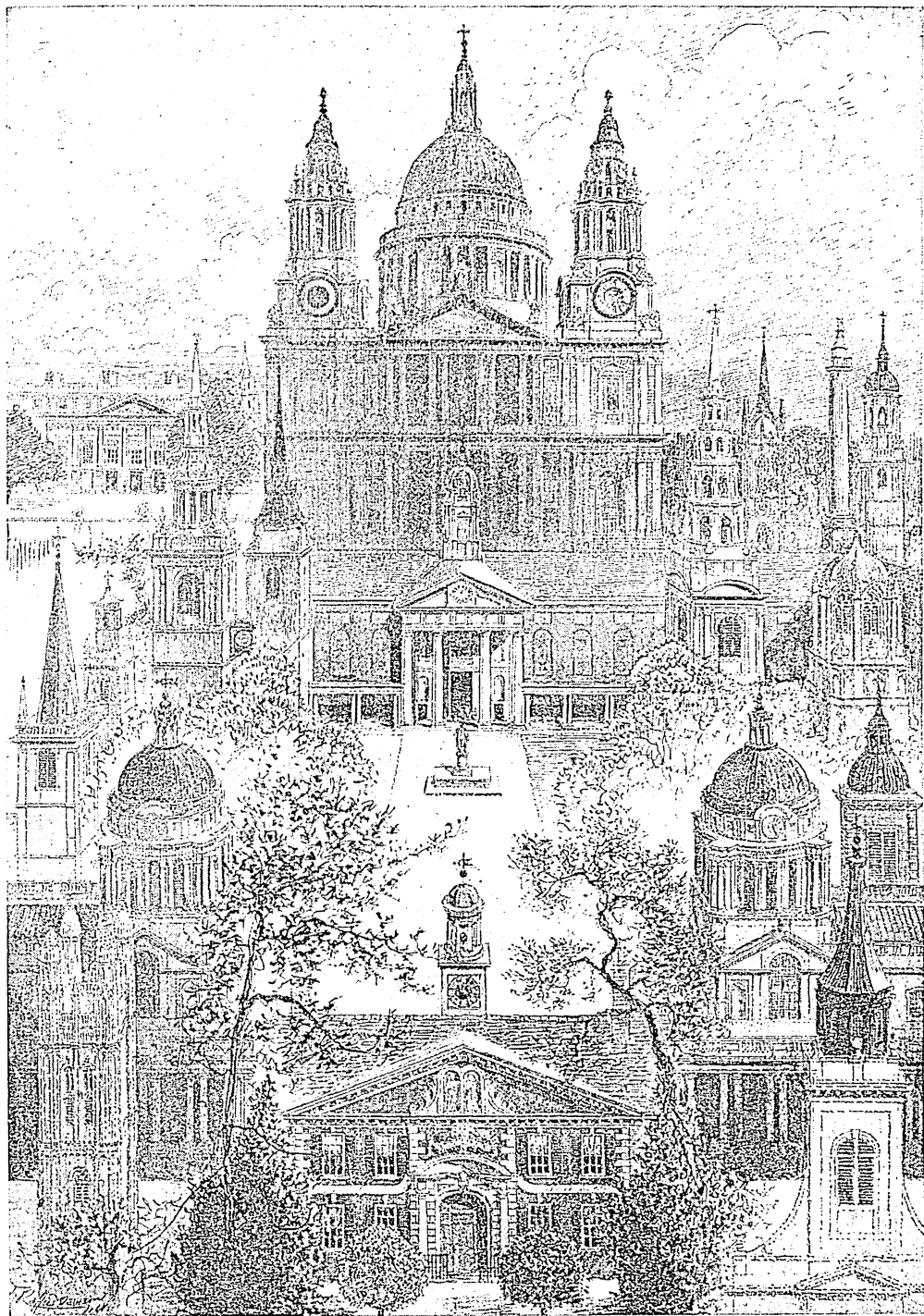
These were the centuries when, for pious or generous motives, many people endowed charitable institutions, hospitals, and almshouses for the needy and the

THE WONDERFUL BUILDINGS THAT KEEP



On this page are shown the following buildings: St. Michael's, Paternoster Royal; Christ Church, Newgate Street; Westminster Abbey; St. Mary Abchurch; St. Stephen's, Walbrook; St. Alban's, Wood Street; St. Clement Danes; Pembroke College, Cambridge; St. Margaret's, Lothbury; St. Swithin's, Cannon Street; St. James, Garlick Hithe; St. Andrew by the Wardrobe; St. Augustine's, Watling Street; Middle Temple Gatehouse; St. Lawrence Jewry; St. Stephen's, Coleman Street; Temple Bar; St. Andrew's, Holborn; St. Mildred's; St. Nicholas Cole Abbey.

ALIVE THE NAME OF SIR CHRISTOPHER WREN



On this page are shown: St. Paul's Cathedral; Hampton Court; St. Bride's, Fleet Street; St. Dunstan in the East; The London Monument; St. Magnus; St. Margaret Pattens; Greenwich Hospital; St. Mary Aldermary; St. Mary-le-Bow; St. Martin's, Ludgate; Chelsea Hospital; St. Michael's, Cornhill; Morden College, Blackheath; St. Benet's, Paul's Wharf; St. Edmund the King and Martyr.

infirm. The oldest almshouse in England is the Hospital of St. Cross, Winchester, built in 1136 and endowed by Bishop Henry of Blois for "thirteen poor and aged men." A hundred years later St. Mary's Hospital, Chichester, was founded for "thirteen poor persons." The fine old Bede House (often called Browne's Hospital), Stamford, was built by Alderman Browne in 1490 for "ten poor men and two nurses."

Another delightful voyage of discovery might be taken in order to pry out the old English guildhalls. The London Guildhall is at their head; in the provinces are some magnificent buildings, like the Butchers' Guildhall, Hereford, the York Guildhall, the Guildhall of Cirencester, to name three of an interesting number. The stamp of Old England is on them all. This same voyage of discovery might also lead to the finding of some of our old and beautiful bridges, like those at Kirkby Lonsdale in Westmorland, and Bideford in Devon; and some lovely and quaint bits of English architecture like the markets at Dunster in Somerset, and Stow-on-the-Wold in Gloucestershire, or Ledbury in Herefordshire. The wanderer in the North Country will do well to go through the Micklegate, York, and Bootham Bar, and meditate on their history and their fine architecture.

ENGLAND'S TWO MASTER BUILDERS, INIGO JONES AND CHRISTOPHER WREN

Here, for the time, we say goodbye to old England and come back to our dividing line. The first person who greets us is Inigo Jones. We do not mean by this that he was the first Renaissance architect in the sense that Adam was the first man; rather is he a person who stands apart from a company sufficiently interesting in themselves. We know that out of a great many architects in Italy, Brunelleschi, Bramante, and Michael Angelo stand out. We should unhesitatingly name them as the three giants, with Palladio perhaps peeping round their shoulders. So, once the sixteenth century passed, English architecture changes, in a way, from a thing to a person. It is looked at from the point of view of two giants, Inigo Jones and Wren. Of the lesser men who preceded these—John Thorpe, the Smithsons, Thomas Holt, the Grumboll brothers, and Westley of Cambridge—we do not know so much. They appear to be more master builders than anything else. For that matter, in that time, architects as we understand them scarcely existed. In

regard to housebuilding, until the real Renaissance came, the man who paid the piper called the tune: the gentleman who commissioned a house to be built, planned it himself, and the builder obeyed.

Inigo Jones was the son of a cloth-worker. He was born in 1573 in the parish of St. Bartholomew's, Smithfield. Not very much is known of his early years except that he liked drawing and sketching landscapes. He appears to have worked as a joiner in St. Paul's Churchyard. When he was still a young man he made his first journey to Italy "and the politer parts of Europe . . . to converse with the great masters thereof."

THE ITALIAN INFLUENCES THAT SHAPED THE GENIUS OF INIGO JONES

In 1604 Inigo returned, and was known as "Mr. Jones, a great Traveller." He played many parts—king's messenger to France, scene producer for a great number of Ben Jonson's and other writers' court plays and masques, designing both dresses and scenery, and interesting devices for moving scenery. In the meantime he was Surveyor of Work to Prince Henry, and when his master died in 1612, Mr. Jones, Traveller, wandered off to Italy again, this time on a commission to collect certain works of art for Lord Arundel.

Inigo rambled all over Italy with Palladio's book on architecture and many other writings of Italian masters to serve as commentary of what he saw. He came back steeped in Italian architecture; in 1615 he was given the post of Surveyor-General of His Majesty's Works, and began his labours as an architect. One of his earliest tasks was the building of a new chapel for Lincoln's Inn, to follow the old chapel, which was pulled down in 1610. As this little church is the only building set up by Inigo Jones in the Gothic manner, it is probable the plans were made by him before his second visit to Italy, before he ceased to be Mr. Jones, Traveller, and a brilliant Jack-of-all-trades, and began to be a great architect.

THE FIRST TRUE RENAISSANCE BUILDING SET UP IN ENGLAND

It is pleasant to think of Inigo Jones's early work. We can see him, a dashing person, with a long feather in his hat, an elegant cloak, and a swinging sword, riding into Lincoln's Inn, hectoring the workmen about his chapel, and talking of the glories of Italy until they felt they could cheerfully murder any Italian they chanced to encounter.

A few years after he built the chapel Inigo was riding round the open fields that lay behind the Inn, having been commissioned to "lay out" Lincoln's Inn Fields, which had been a notorious place for duelling and a haunt of thieves, and build some houses there. His traces are left on the square, chiefly in Lindsay House, No. 59 and 60 on the west side. A good deal of other work he did, here and there. His first great labour, begun in 1619 and carried over many years, was the rebuilding of Whitehall Palace. Owing to Charles the First being so short of money, the stupendous plan could not be carried out. Only the Banqueting Hall was finished—now the United Service Museum in Whitehall. This is the first true Renaissance building to be set up in England; we see for the first time the pilasters, pediments, and balustrades of the Italian art.

The Banqueting Hall, together with the plans of the whole, has set men pondering in every generation since, wondering how so much restraint and dignity, genius in proportion, and far-flying ideas could have lain in the brain of one man. Whitehall Palace would have covered about four times the area of the Houses of Parliament.

THE WONDERFUL BANQUETING HALL OF INIGO JONES, IN WHITEHALL

Inigo Jones showed himself at once capable of laying out a huge space—that great test in architectural strength. His work gave a startlingly bewildering revelation of qualities which the Elizabethans had lacked, the management of large masses of architecture from the point of view of proportion and distribution of weight. The Banqueting Hall, Whitehall, is called the most accomplished piece of proportion in England.

After this work Inigo Jones was kept very busily employed. He was given a special grant for riding expenses, and much time was spent on horseback, going here and there to superintend buildings that were rising to his plans.

One of his small works is the York House Watergate at the lower end of Buckingham Street, Strand. It was very beautifully proportioned, and it is a disgrace to London—one of the many of such nature—that it should be now almost hidden. In 1631 Jones began building St. Paul's, Covent Garden. About a hundred and fifty years later it was burned down, but fortunately it was set up again on the original plan, and stands to

this day a memento of the architect's extraordinary boldness and force.

A good many things are ascribed to Inigo Jones about which nothing certain can be said, as, for instance, the porch of St. Mary's, Oxford, which was carved by Nicholas Stone, and Heriot's Hospital, Edinburgh. He was consulted about everything that was of importance. Early in the seventeenth century he was told to look at old St. Paul's, with an eye to a gradual rebuilding. Owing to various obstacles—like the civil war—his plans were not carried beyond the south transept.

THE MARKS THAT INIGO JONES AND WREN LEFT BEHIND AT GREENWICH

Jones's next most important work to the Whitehall building was the planning of the group now known as Greenwich Hospital. This had formerly been a Royal Palace, built in the fifteenth century, one of the favourite homes of Tudor kings. Henry the Eighth and his daughters Elizabeth and Mary were born at Greenwich, in the Pleasaunce, as the palace was called. The place gradually fell into neglect. Inigo Jones built Queen Henrietta's House, facing the park, for the wife of Charles the First, and from his plans, in Charles the Second's time, his pupil, helper, and successor, John Webb, began the western block of the palace.

Inigo Jones thus set going a magnificent group whose spirit only Wren, who finished it, was big enough to capture. The glory of this superb block of architecture is shared between the two greatest architects of England. When Wren did his work at Greenwich, the last change in the palace fortunes had come. Queen Mary had decided, in 1699, to finish it and turn it into a hospital for disabled seamen. Wren, working at the order of King William, got through the immense labour of building the remaining blocks by 1705.

ONE OF THE MOST BEAUTIFUL ROOMS IN ANY HOUSE IN ENGLAND

A good many other works were absorbing Inigo's attention; much of them, unfortunately, has been lost, like his additions to the old Somerset House. When the civil war came he called in his good servant Nicholas Stone the sculptor, and between them they buried the architect's money in the Lambeth marshes, and fled.

Jones took refuge with some friends in Basing House, in Hampshire, and helped to fortify the building so well that Cromwell besieged it two years before it fell.

Inigo then became a prisoner with the rest, and his share of fines was about a thousand pounds. Here the money in the Lambeth marshes doubtless came in useful.

As soon as the turmoil was over Inigo went on with his building again. He was now engaged on his work at Wilton House, Salisbury, a building which has suffered many changes since. Mercifully the south block still exists, with Jones's famous Double-cube room, which has been described as the most beautiful room in any house in this country. His last working years were spent on many such buildings in various parts of the country, whereof scraps remain, like the staircase of Ashburnham House, Westminster.

THE CHURCH OF CHRISTOPHER WREN IN WHICH INIGO JONES LIES SLEEPING

Inigo Jones died in the midsummer of 1652, and was buried by the side of the old cloth-worker, his father, in St. Benet's Church, then described as on Paul's Wharf. Wren rebuilt St. Benet's 30 years later. It is now a Welsh church, and thousands of people pass near it in Queen Victoria Street every day, probably never thinking that there lies Inigo Jones, called by some authorities the greatest architect and one of the most accomplished artists this country has produced.

Generally speaking, he has been overshadowed by Wren. During the gap between these two great men there was little work done save by John Webb, Jones's assistant, who carried out some of his master's plans and built, among other things, from his own design, Thorpe Hall, near Peterborough.

Christopher Wren was born at East Knoyle, Wiltshire, in 1632. There is a certain rough parallel between his early life and that of Inigo Jones, and this in spite of the immense social difference. Wren was the son of the Dean of Windsor, nephew of the Bishop of Ely. He went to Westminster School and on to Oxford.

THE VERSATILE GENIUS OF WREN IN HIS EARLIER YEARS

Like Inigo, he did not turn to architecture until he had interested himself in many other things. From the point of view of art, Inigo, the cloth-worker's son, was more fortunate. He was "a Mr. Jones, a great traveller"; the other was spoken of as "that prodigious young scholar, Mr. Christopher Wren." Wren busied himself till he was nearly thirty on scientific problems, astronomy, various

inventions. He was indeed a most gifted and clever person. Just what outlet his genius would have found had he been left alone, so to speak, one cannot estimate. In 1661 he was appointed Assistant Surveyor-General of His Majesty's Works, the post Inigo Jones had held.

Good John Webb was very much aggrieved. He had hoped to attain to that eminence. And other men whose merits were negligible had also hoped. When the choice alighted on the prodigious young scholar Mr. Wren, England was, unknown to the patrons of the post, receiving an immeasurable, incalculable benefit. For the Fire of London was coming, and the rebuilding of the city. We dare not think of the result to England had the King's adviser been a weak architect.

Wren's first works were Pembroke College Chapel, Cambridge, and the Sheldonian Theatre, Oxford. It is considered that the great master's best work in Oxford is the interior of Trinity College Chapel. The finest building set up in Oxford in this period is the Ashmolean Museum, built in 1677, and long attributed to Wren. Recent investigations have proved that it was the work of an architect called Wood, who was destined by an unkind fate to be forgotten.

THE MOST WONDERFUL OPPORTUNITY AN ARCHITECT EVER HAD

In the summer of 1665 Wren went to Paris. The six months he spent there provided the only travelling studentship he ever had. The Palace of the Louvre, the masterpiece of the French Renaissance, was just then rising, and the best artists of the period were collected in Paris. Bernini, the Italian, was the first architect of the Louvre (his plans were presently discarded), and Wren had the good fortune to meet him. In one of Wren's letters from Paris he gives a fine little description of the encounter:

Bernini shew'd me his Designs for the Louvre and of the King's Statue . . . his design of the Louvre I would have given my skin for, but the old reserv'd Italian gave me but a few Minutes view; it was five little Designs in Paper, for which he hath receiv'd as many thousand pistoles; I had only Time to copy it in my Fancy and Memory; I shall be able by Discourse, and a Crayon, to give you a tolerable account of it.

When Wren returned to London the subject of the old St. Paul's was once more

raised, and he set to work on it, following Inigo Jones's plan. The Great Fire put an end to that. It also gave to Wren the most wonderful opportunity that any architect ever had. The City of London had to be rebuilt, cathedral and all. Wren drew up a plan for the rebuilding which was a work of sheer genius.

The centre of the City was to be the Royal Exchange. From it should radiate ten streets each sixty feet wide. Running westward from this centre were to be two great streets still wider, one touching the Guildhall, which was to be surrounded by the halls of the twelve great guilds, and another running down to St. Paul's. In front of the Cathedral, facing westward, was to be a great round piazza, and from it should radiate eight streets. Another large semi-circular space was to be at the end of London Bridge, with radiating streets. The choked river bank was to be turned into a broad quay. And "all offensive trades, and those that used great fires, were to be banished out of the city."

THE SELFISHNESS THAT OVERRULED THE LOFTY IDEAS OF CHRISTOPHER WREN

Had this plan been carried out London would have been one of the world's great sights, a truly lovely city. The King agreed to the "lay out." Then practical points arose. With a magnificent disregard of private feeling, Wren had driven his new imaginary streets over the ashes of the old huddled houses, the alleys and the courts of old London. We can imagine the outcry of freeholders who wanted their houses and shops rebuilt exactly where they were.

Wren had arranged a scheme whereby no man should suffer, unless he called it a grievance to find his new house a few yards this way or that of the old site. The land would be there, the houses would have the same area and frontage, with the ancient rights appertaining thereto. The freeholders of London refused to agree. They were not concerned in making the city a magnificent place, their own share of which would have to be taken on trust. They wanted their homes rebuilt on the exact spot. Wren was obliged to give way. London grew up again with choked, narrow streets. In later times millions of pounds have been spent on clearing some of these alleys and remodelling the City largely on Wren's generous lines.

The great architect was beaten on the point of town-planning, but his fine vision won for him another, less contested, battle. He could at least make London a city of magnificent churches, of mounting steeples, towers and spires, whose sky line, viewed from the river, which was then a great highway, would make a man want to praise God.

CHRISTOPHER WREN'S MASTERPIECE AND THE MONUMENT TO HIS GENIUS

The houses of the seventeenth century, which rose as the churches rose, were comparatively small, low buildings, and among them the new churches towered up with a royal distinction. But the interest of trade, and the shortsightedness of the City Corporation, have been responsible for building miles of ugly ten-storey warehouses that dwarf the lovely city of spires, and also, largely in the interests of trade, pulling down a good many of the old churches that might well have been kept for their artistic value or as rest-houses for the people.

Wren built fifty-three churches within the sound of St. Paul's bells. His finest church is generally supposed to be St. Stephen's, Walbrook, and the loveliest steeple that of Bow Church. The pinnacle of his fame is St. Paul's Cathedral, the family church of the British Empire, such a loved and familiar sight that to describe it is like describing one's grandfather in his own house.

Owing to the crowding of the houses in the Churchyard we never have a chance of estimating the huge size of St. Paul's, with its fine classical columns and portico. The actual building has an area of about 64,000 square feet. It is built on the plan of a Latin cross, like the older churches, and the huge dome rises at the crossing of the nave and transepts. Part of Wren's supreme genius lay in his solving of the mathematical—one might say engineering—problems of his buildings.

THE GREAT TRIUMPH OF ST. PAUL'S. THE TRIPLE DOME OF LONDON

His greatest triumph was the dome which, from the outside, is one of the finest if not the finest in Europe, and it is very beautifully flanked by the two tapering towers over the façade, one containing the church bells and the other the clock.

This dome was aptly "labelled" a little time ago, by a child who had been to see St. Paul's and made a rough sketch from memory. "Look," said the little one,

"I've drawn the dome of London." Wren would have been pleased at the description, for he was determined that his dome should be unequalled.

It is very interesting to learn how, in the matter of this dome, Wren got the best of both worlds, as the saying is. There are two chief things among many others to be considered about a dome, its interior and exterior appearance.

**THE DOME OF ST. PAUL'S AND
THE DOME OF ST. SOPHIA**

The most perfect dome in the world, from the inside, is that of St. Sophia, Constantinople. This dome is perfect (from the inside) because its lines are not too lofty for human sight. The eye should be able to follow the sphere of the dome without any sense of strain. If the dome is too lofty there is a breaking point in the observer's vision, and the illusion of a sphere, like a rounded heaven itself, is lost.

The perfection of St. Sophia's dome is internal only. Outside, it is lost; it does not soar above the walls of the cathedral, because it is a true dome—that is to say, its inside and outside are practically one construction. Now, Wren wanted his dome to be beautiful inside, and he wanted it, outside, to be the "dome of London." He therefore built three dome constructions. The inner one is that magnificent sweep which overhangs the crossing, inside. It is not too lofty; the eye is a little strained, but not to the breaking point of the illusion of an unbroken circular shape.

Above that is a huge cone hidden in the masonry, which no one can see, its apex being almost the height of the outer dome. It is a miracle of construction and supports the chief weight of the lantern and cross that surmount the cathedral at an enormous height. Outside this cone, the outer dome, a mere shell, is built, the Dome of London, which appears to carry the lantern and cross, and to the eye is the same dome as that seen from inside.

**THE TREMENDOUS VOLUME AND VARIETY
OF THE WORK OF WREN**

From the point of view of pure architecture, this is a "fluke." Effect only considered, it is a fine achievement.

The interior of St. Paul's has the lofty, rather heavy grandeur of a Renaissance church, and is already marked by a large number of magnificent monuments. In actual workmanship, of good work, iron work and glass, it can never have the

merit of Westminster Abbey, for there we see the loving work of craftsmen who were geniuses in the bygone centuries of true craft work.

As a builder, a man who caused to be erected an enormous mass of buildings, Wren has no peer. He is one of the world's supreme geniuses. But in a matter of pure taste and restraint, he is second to Inigo Jones who designed, in comparison with Wren, a mere smattering of buildings. Jones was the greater artist. If we compare the work of the two on Greenwich Hospital, we see the difference. Wren's work is magnificent; it pleases the eye at once without any thought; the masses well-grouped, the domed towers set just at the right point. Inigo Jones' Greenwich work is less easily appreciated, but it is finer, subtler, the proportions more delicately pleasing.

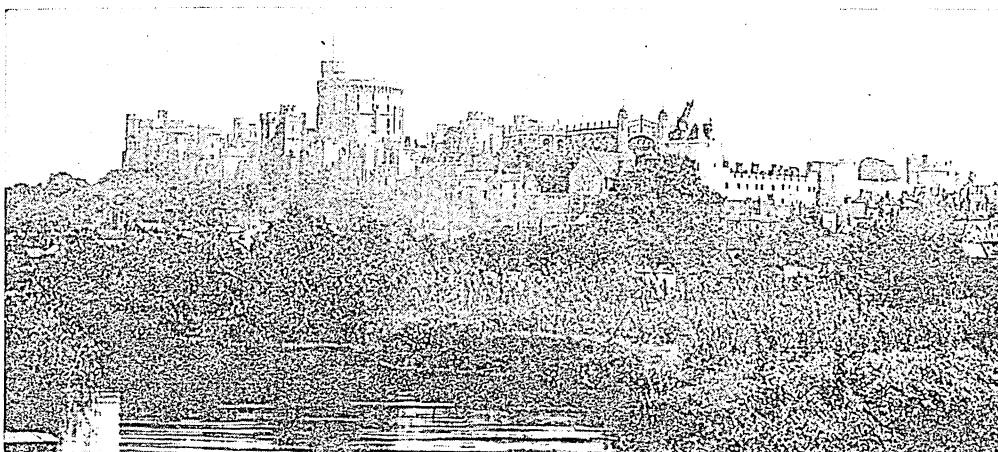
We are very proud that one of the modern world's master builders was an Englishman, that on this point we need not bow the knee to Italy or France. To think of the work Wren got through before he died, at the age of ninety-one, is to receive an impression that most people do not understand the meaning of work. Fifty-four churches, eight colleges, thirty-five halls of various kinds for City companies and the like, four palaces, in part and whole, and about fifty other works of varying importance, such is the record of Sir Christopher Wren.

**THE STEPS THAT LEAD UPWARD
LIKE AN ENDLESS CHAIN**

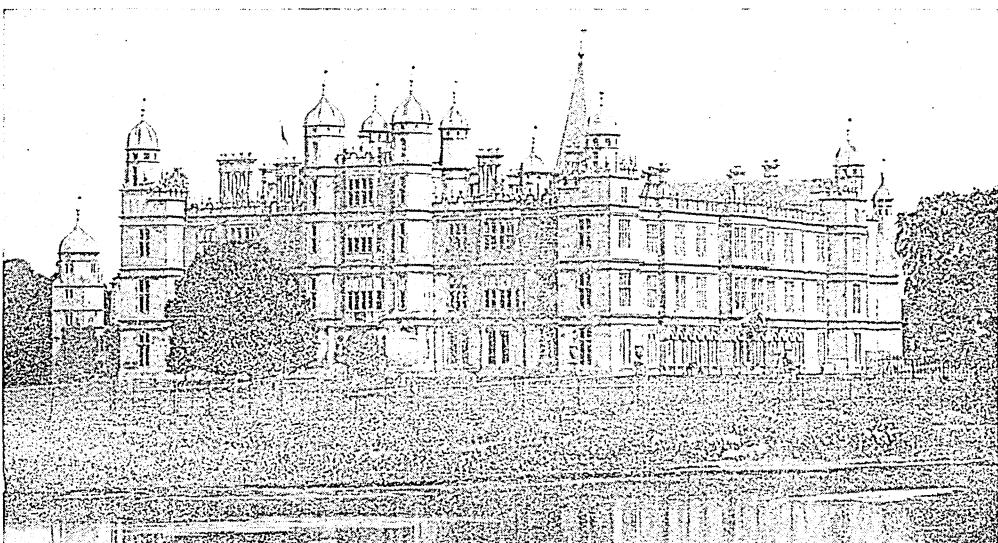
The smaller works include buildings of intense interest like the Monument, which rose like a finger pointing to heaven, now alas, scarcely visible above the office roofs, and the Temple Bar, the westward gate of London city, which an ungrateful generation removed in 1878, because it obstructed traffic. It is now set in Theobald's Park, near Waltham Cross. Wren's work in the Temple has added another touch to the loveliest of the Inns of Court.

When the giant died he had, like Michael Angelo, many followers, none of whom could in any way measure forces with him. The true Renaissance had risen to its height and was sinking. But it was leading to another architecture, a domestic architecture, which is one of our national attainments—the homes of the Georgian era. So, in an endless chain, do we see our great periods linked up, and our work for ever progressing.

HOMES OF ENGLAND



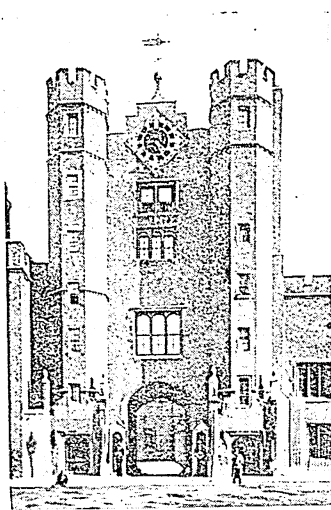
WINDSOR CASTLE. THE HISTORIC HOME OF THE KINGS OF ENGLAND



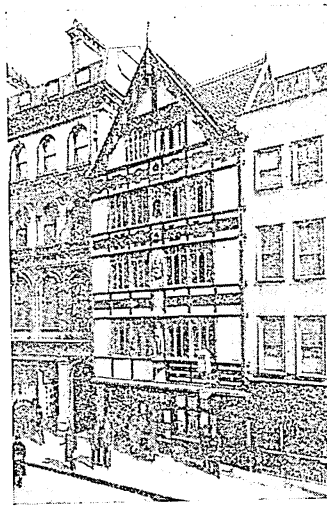
BURGHLEY HOUSE, NEAR STAMFORD, IN LINCOLNSHIRE, BUILT IN THE SIXTEENTH CENTURY



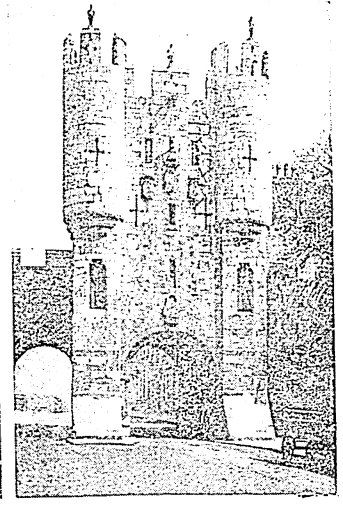
WARWICK CASTLE. BUILT IN THE FOURTEENTH CENTURY



THE GATEHOUSE OF ST. JAMES'S
PALACE, LONDON



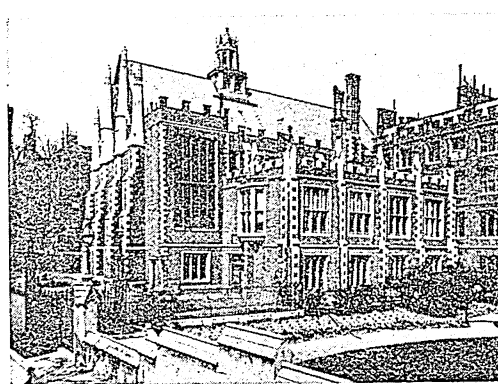
THE OLD FRONT OF CROSBY HALL
FORMERLY IN BISHOPSGATE



MICKLEGATE BAR, AN OLD
CITY GATE IN YORK



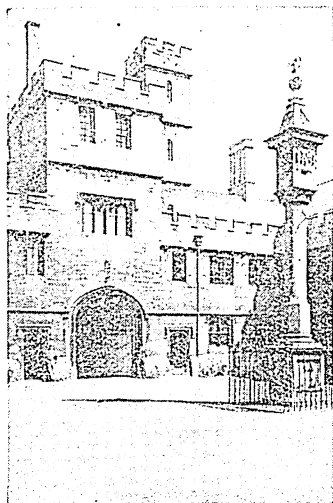
HATFIELD HOUSE IN HERTFORDSHIRE, BUILT EARLY IN THE SEVENTEENTH CENTURY



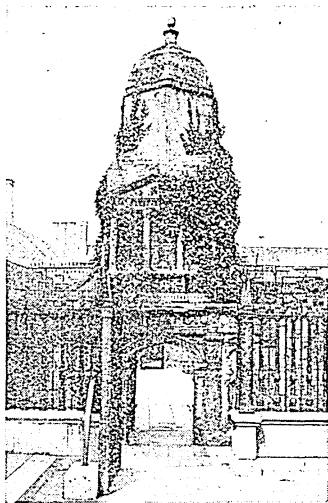
MIDDLE TEMPLE HALL IN LONDON



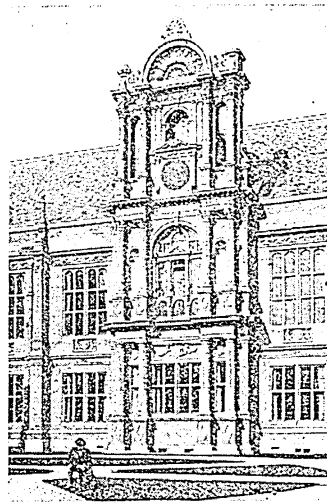
KING'S BENCH WALK IN THE TEMPLE



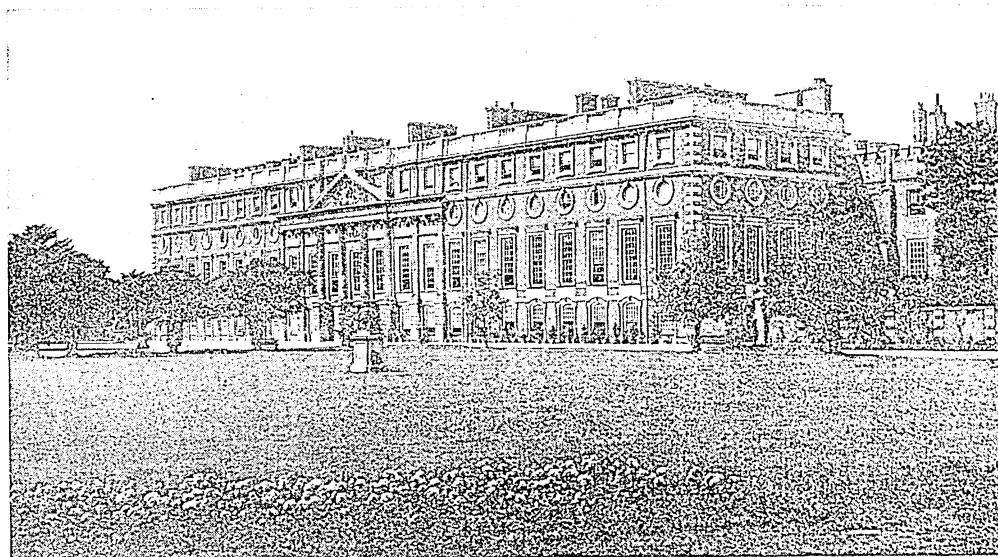
THE QUADRANGLE, CORPUS CHRISTI COLLEGE, OXFORD



THE GATE OF HONOUR AT CAIUS COLLEGE, CAMBRIDGE



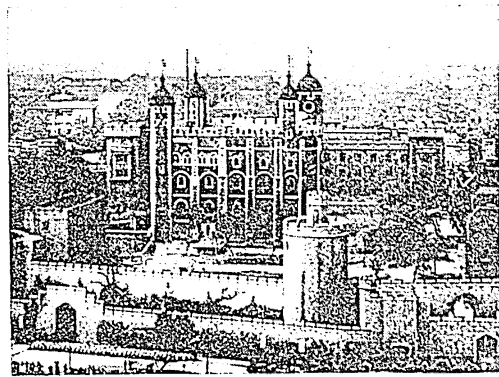
THE QUADRANGLE, NEW EXAMINATION SCHOOLS, OXFORD



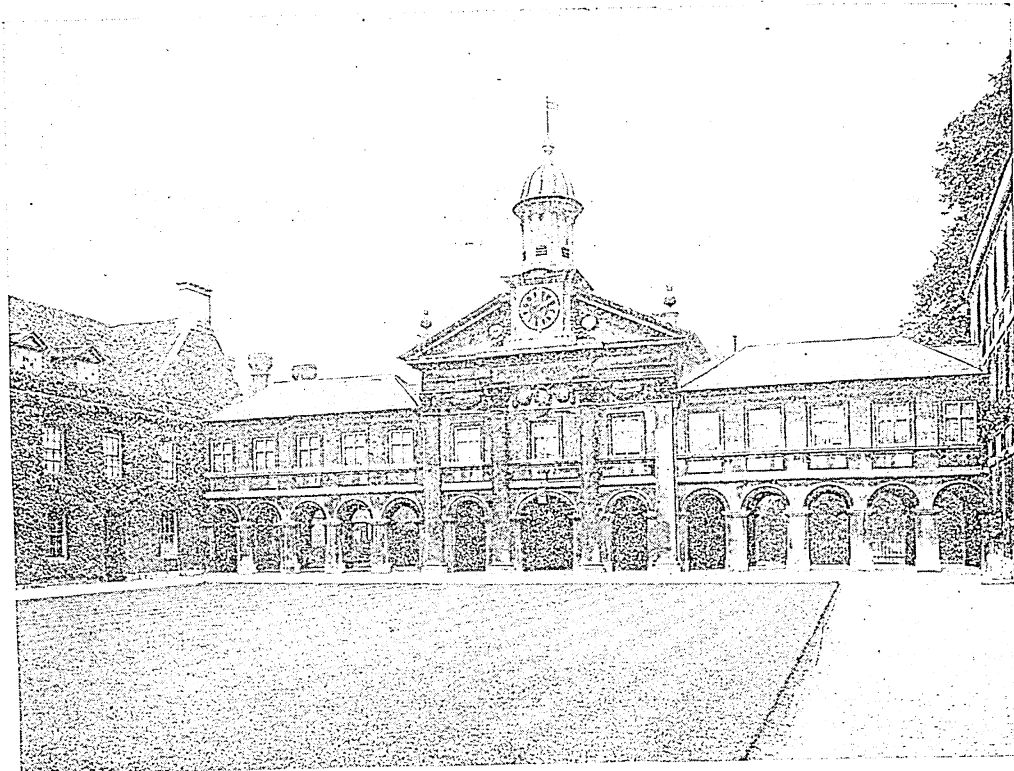
THE EAST FRONT OF HAMPTON COURT PALACE, BUILT BY SIR CHRISTOPHER WREN



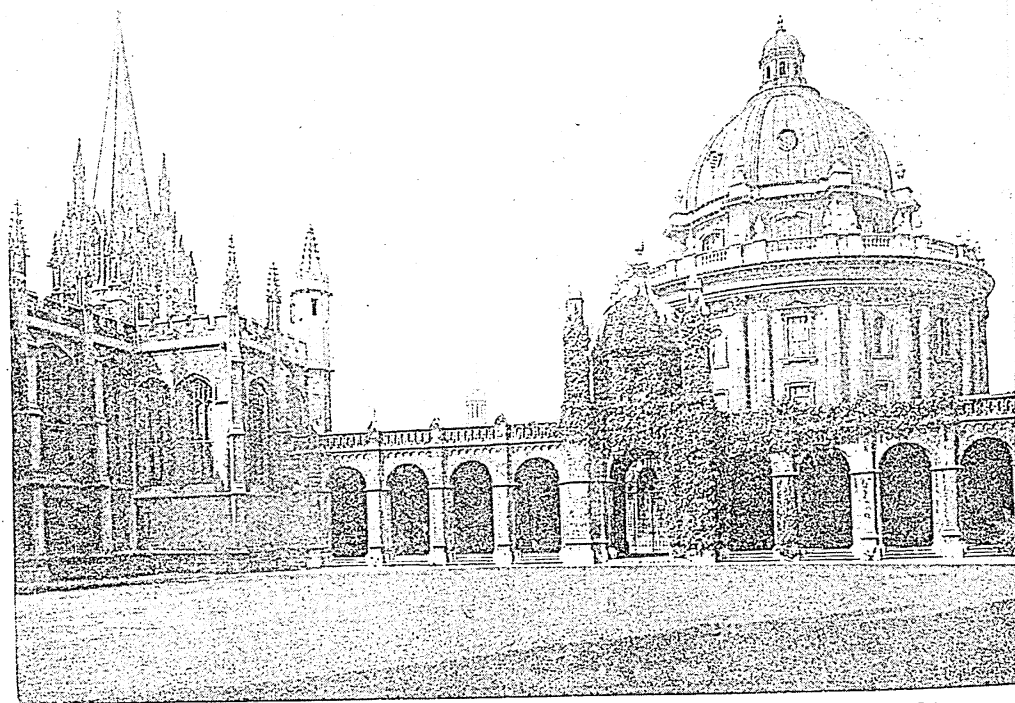
SUTTON PLACE, NEAR GUILDFORD SURREY



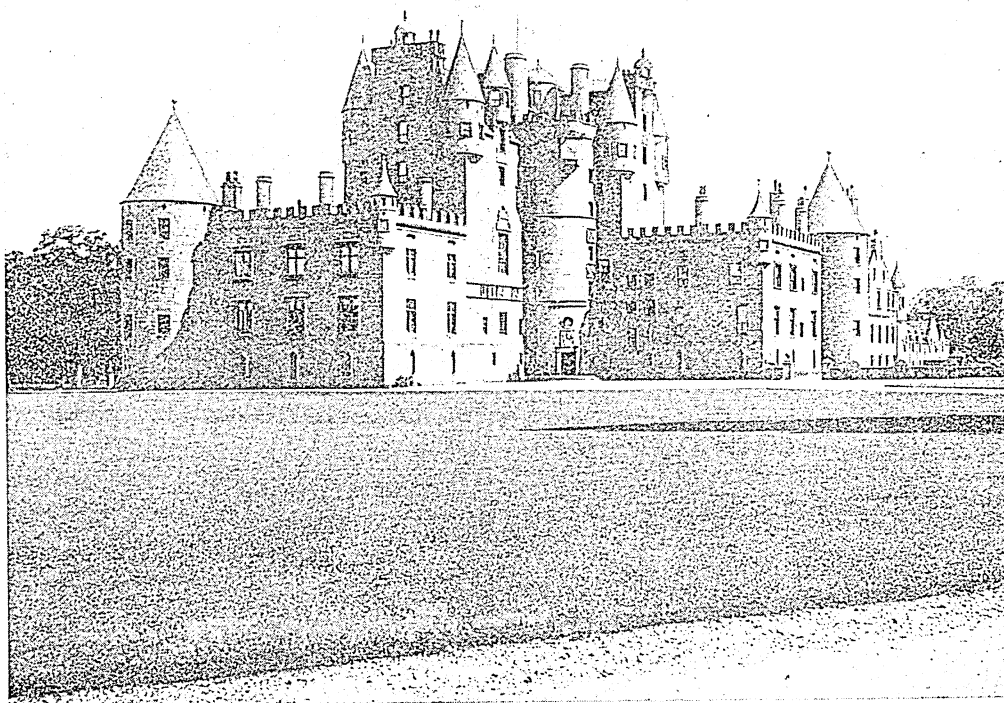
THE TOWER OF LONDON



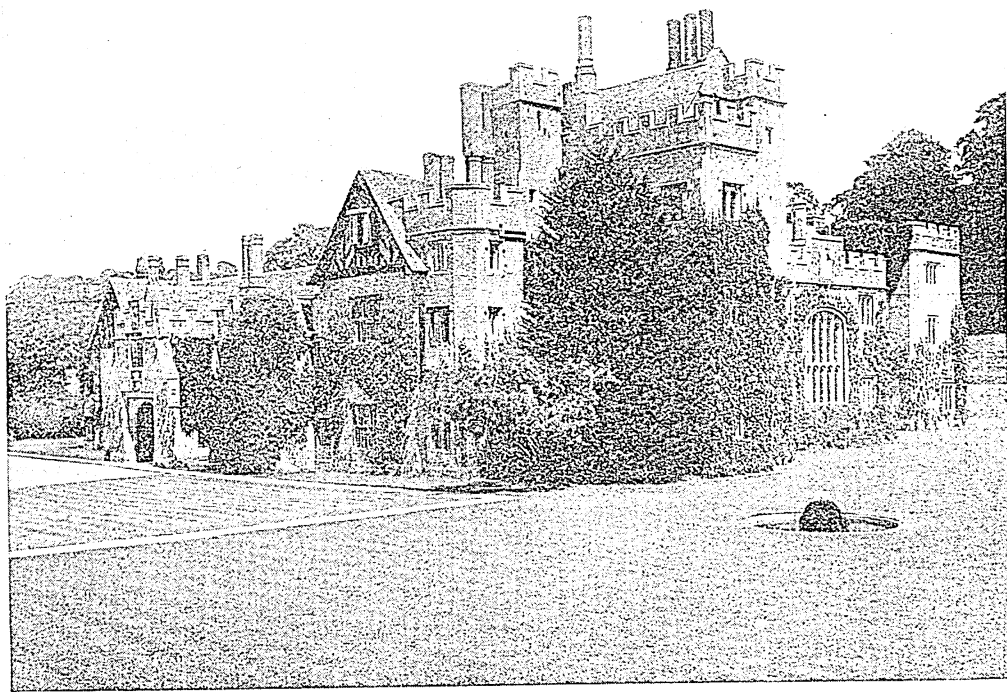
THE CHAPEL AND CLOISTER OF EMMANUEL COLLEGE, CAMBRIDGE. BUILT BY SIR CHRISTOPHER WREN



QUADRANGLE OF ALL SOULS COLLEGE. OXFORD, SHOWING RADCLIFFE CAMERA



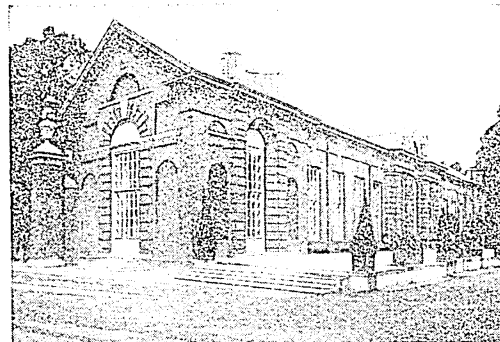
THE BARONIAL CASTLE OF GLAMIS IN FORFARSHIRE



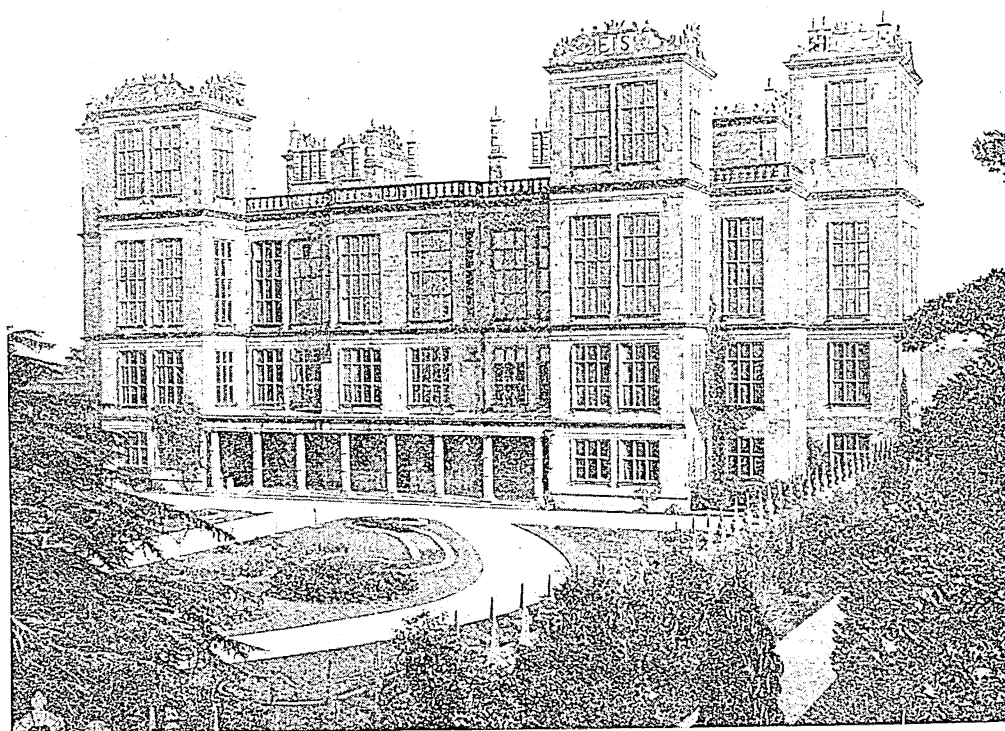
THE BEAUTIFUL MANOR OF COMPTON WYNYATES IN WARWICKSHIRE



WADDESDON MANOR IN BUCKINGHAMSHIRE



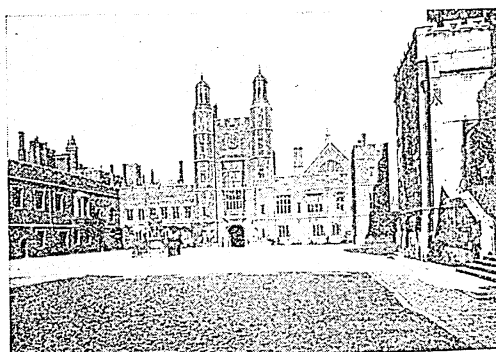
WREN'S ORANGERY IN KENSINGTON GARDENS



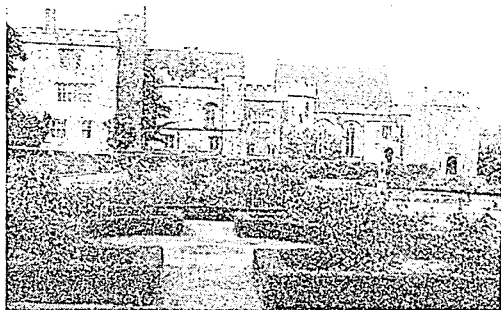
HARDWICK HALL IN DERBYSHIRE, BUILT AT THE END OF THE SIXTEENTH CENTURY



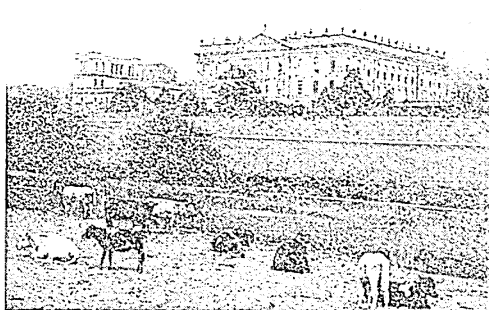
OLD ALMSHOUSES AT HASLEMERE IN SURREY



THE QUADRANGLE OF ETON COLLEGE



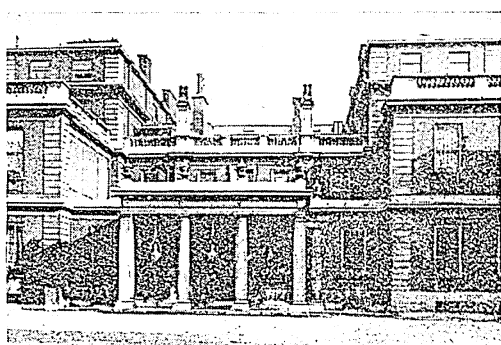
PENSHURST PLACE IN KENT



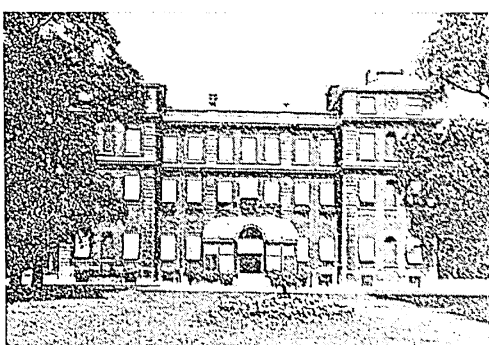
CHATSWORTH HOUSE IN DERBYSHIRE



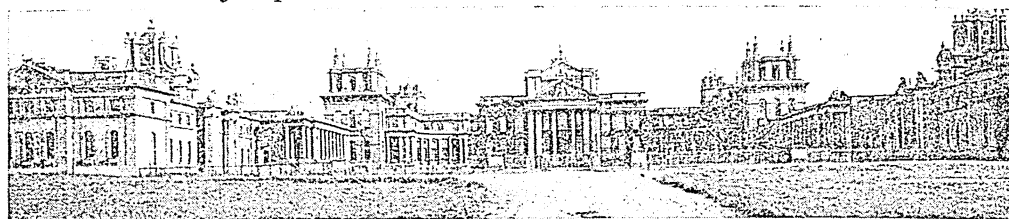
THE WEST FRONT AND GREAT GATEHOUSE OF HAMPTON COURT, BUILT FOR CARDINAL WOLSEY



MARLBOROUGH HOUSE. LONDON. BUILT BY WREN



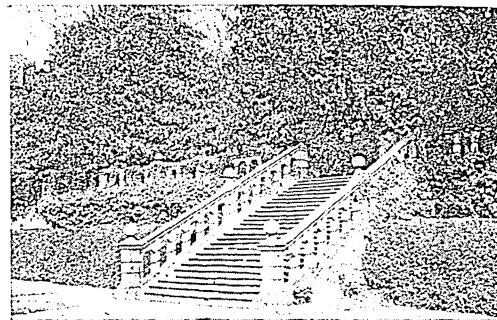
THE GARDEN FRONT OF MARLBOROUGH HOUSE



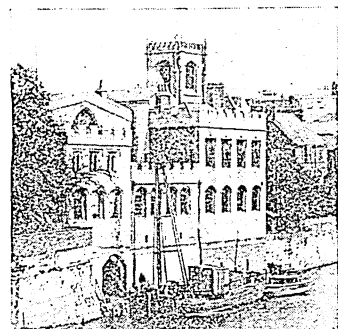
BLenheim HOUSE IN OXFORDSHIRE. DESIGNED BY SIR JOHN VANBRUGH



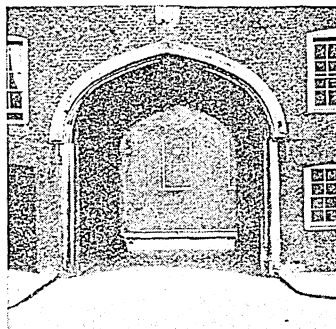
HADDON HALL IN DERBYSHIRE



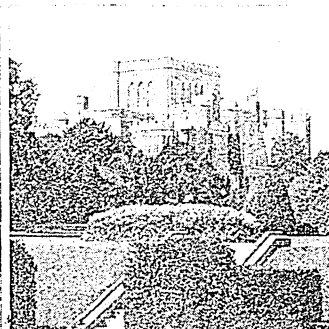
A TERRACE STAIRWAY AT HADDON HALL



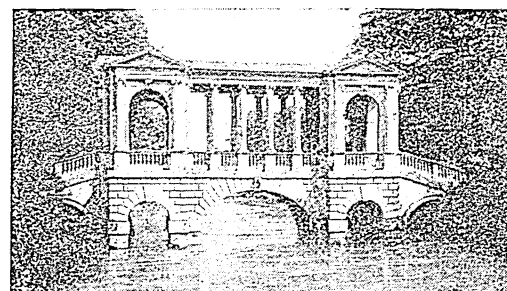
THE GUILDHALL AT YORK



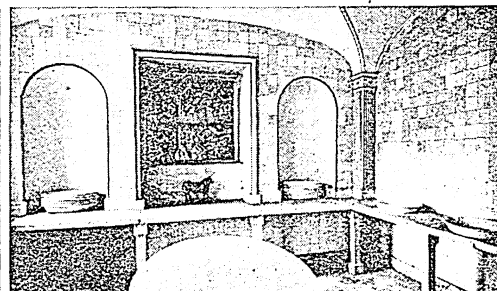
THE GATEWAY, LINCOLN'S INN



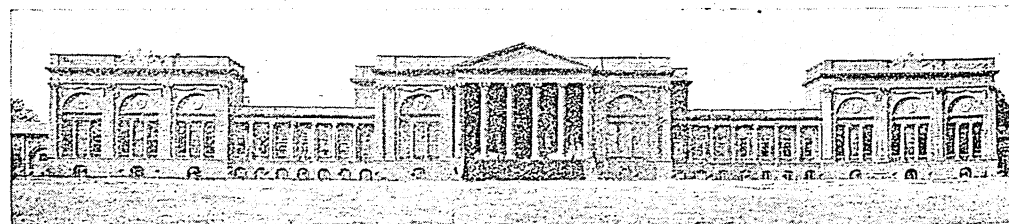
ASHRIDGE IN HERTFORDSHIRE



THE COVERED BRIDGE AT WILTON HOUSE, SALISBURY, BUILT BY INIGO JONES



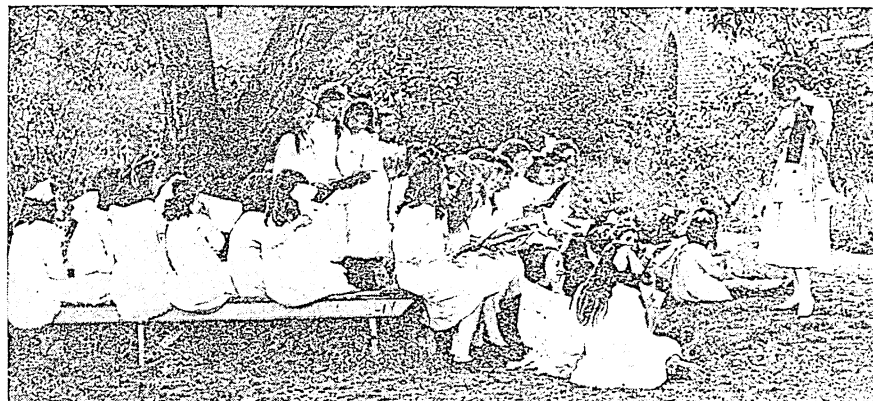
THE DAIRY OF BROADLANDS, NEAR ROMSEY, DESIGNED BY THE BROTHERS ADAM



STOWE HOUSE IN BUCKINGHAMSHIRE, BUILT ABOUT 1660

The pictures on these pages are by Messrs. King, Piggott York & Son, and others

The Wonderful House We Live In, and Our Place in the World



An open-air school for children

WHAT THE STATE DOES FOR US

As civilisation progresses, the State, by which we mean the whole body of the nation, expressing itself as a community agreeing to obey certain common laws, takes more and more notice of each new life that comes into it. This means that the community realises increasingly the value of each life, and seeks to help and to preserve it.

No sooner is a child born than the State takes notice of the new arrival. It is the law that the parents must go to an official called the Registrar and state the date of the child's birth, what Christian name it is to be known by, and the names, address, and professions of the father and mother. The Registrar notes these things down in a big book, and issues to the child's parents a long strip of paper called a Birth Certificate, which is very useful to the child as a proof of identity. There are Registrars in each district, and they send copies of the Birth Certificates to an official at Somerset House, London, who is called the Registrar-General. So, year by year, we are able to tell exactly how many people are born.

It was not until the year 1836 that the registration of births was made compulsory; and it was later still that the State began to concern itself with seeing that children go to school.

Now we have what is called Compulsory Education, parents being compelled by law to send their children to school; and Education is not only compulsory but free. Under the law the Local Authorities are compelled by Parliament to establish and maintain proper schools, and the cost of keeping them up is shared between the Local Authority and Parliament. A certain standard of education has to be maintained, and Government inspectors go to the schools to see that they are properly conducted.

The law lays down that all children must go to school between the ages of five and fourteen. If parents do not send their children to the State's free schools, they must send them to other schools which are recognised as efficient.

So we see that the State not only takes notice of our being born, but makes provision that we must be schooled.

But suppose parents are so very poor that they cannot send their children to school well fed so that they may profit by what they learn. That point is dealt with in the Provision of Meals Act. Under this law, Local Authorities can set up Feeding Centres which supply good meals to hungry children. The number so fed varies with the state of trade, but it is considerable when there is much

unemployment. Early in 1924, when there were over a million people unemployed, some of the town authorities were feeding thousands of children. In one London Borough alone there were 900 children attending the Feeding Centres.

The Education Act of 1918 laid down that it was the duty of the Council of every County and County Borough to contribute to our national system of public education by "progressive development and comprehensive organisation." So each Local Council is charged with the sacred duty of training the young, both mentally and physically, and of supplying and training teachers to carry out their important work.

Boys and girls attending the free public Elementary Schools have the chance, by passing examinations, to win scholarships or endowments enabling them to pass as free scholars into advanced or Secondary Schools, or even to the great Universities. This is sometimes called the Educational Ladder, and it enables gifted children to rise from the humblest positions in life to our most celebrated schools of learning, and thus prepare themselves for high positions in the world.

SAFEGUARDING THE HEALTH OF THE MEN AND WOMEN OF TOMORROW

As to the physical well-being of children, the Local Educational Authorities have power to provide school doctors, school dentists, and school oculists, and these are doing an increasingly important work. Children are being helped to grow up with good teeth and eyesight, things of the gravest importance. Then, again, the Educational Authorities are increasingly looking after children who have the misfortune to be defective, and special schools are established to care for their lives.

Here we may note with pleasure that the State is taking more interest in the terrible cases of the blind, the deaf, and the dumb. Establishments for Blind Babies have been set up, so that they may be cared for scientifically before they reach the school age of five, when they go to special schools. It is found that much can be done by thought and care to train the sightless, and to make them useful and happy citizens. The number of blind people in England and Wales is nearly 40,000.

The number of either totally deaf or deaf and dumb people is even larger than that. Until recent years the training of such unfortunate people was left entirely

to private charity, but in 1893 it was made compulsory for Educational Authorities to provide training for deaf and dumb children. So we see society again realising and fulfilling its honourable obligations to come to the aid of the unfortunate.

THE BAD OLD DAYS WHEN CHILDREN WORKED IN COAL-MINES

When boys and girls pass from school to work, the State continues to care for them. In the old days, unfortunately, that was not the case. It was long after coal-mines were dug, and factories set up, that laws were made to protect children. A few generations ago a child could be worked all night in a factory, or sent down into the depths of a mine. In the early coal-mines little children were actually used as beasts of burden to drag tubs of coal deep down in the darkness. Those bad old days we have put behind us, as law after law has been made by Parliament to restrict the hours of labour of young people, and to prevent them from working at all under a certain age. As time has gone on, too, laws have been made to protect grown-up people in their work, and now there is a great body of legislation to make work healthy, comfortable, and safe, and inspectors are paid by the State to go round and see that the laws are obeyed in mines, factories, and workshops. Thus, children are not now allowed to work in mines at all, and, save in certain exceptional cases, no child under fourteen is allowed to work in a factory.

The first Factory Act was not passed until 1802, long after factories were set up. This law is of special interest to children, because it was the first to set out that child workers should not work too long. Law after law was passed after that, making life in factories healthier and safer, until in 1901 a great Factory and Workshop Act was passed which amalgamated all previous laws. This Act was further improved in 1911.

HOW THE LAW PROTECTS WOMEN AND CHILDREN WHO WORK IN FACTORIES

This great Factory law sets out things that must be done and things that must not be done. The factory owner must keep it clean, and supply lavatories and fire escapes. All factories must be properly ventilated. Children may not be set to clean machinery, and women and young people are not allowed to clean machinery while it is in motion. The hours during which women and children

WHAT THE STATE DOES FOR US

may work are carefully restricted, so that their health shall not suffer. Thus a woman may not legally work for more than 66 hours in one week, and that period must include at least ten hours for meals, and the Saturday half-holiday must be allowed. Before a boy or girl under sixteen can be employed at all in a factory a medical examination has to be passed to make sure that the young person is fit for such work.

THE WEEKLY HOLIDAY FOR ALL WHO WORK IN SHOPS

As to mines, the State, which allowed tiny mites to work in the darkness in the bad old days, now strictly governs the work of those who follow this dangerous employment. There are strict laws as to the use of explosives, ventilation, and hours of labour, and children may not work in the mines at all.

Or suppose that a boy or girl, on growing up, decides to be a shop assistant. Again the State takes care of the worker. By an Act passed just before the Great War all shops have to be closed for one half-day in the week to give the assistants a holiday. There is also a law restricting the hours of shop labour worked by young people. Another law says that where girls and women are employed as shop assistants the employer has to provide one seat for every three assistants, so that they need not stand all the time they are at work.

Or suppose a boy decides to become a sailor. The law takes notice of the fact, and does much to protect him. A ship-owner is compelled to provide certain accommodation for the crews he employs, and he must supply a certain scale of rations. Then the ship itself is not allowed to go to sea unless it is built soundly and safely, and it must not be loaded so that the ship is lower in the water than a certain definite loading line, which is called the Plimsoll Mark, after the name of the man who brought about this particular law.

THE INSPECTORS WHO SEE THAT THE LAW IS CARRIED OUT

The object of all these labour laws is to make work safe, comfortable, and healthy as far as that can be done. It is to be feared that the law is not always thoroughly obeyed, but the State employs inspectors to go round and see that the various enactments are carried out, and employers are prosecuted and punished if they do not obey. There is no doubt that these protective laws are doing much to improve the

health of workers and to lengthen their lives by preventing disease and accident.

If an accident occurs in a factory, mine, railway, or other place where work is done, the State again interferes. There is a law called the Workmen's Compensation Act which provides that, if a man is killed while working, his employer must pay a certain compensation to his widow or those dependent on him.

Or suppose that the person working is not killed, but is injured more or less severely. In that case the employer is compelled to compensate the worker by paying a part of his ordinary wages as long as he is unfit to work through the accident.

Employers meet this great liability by insuring their risk with insurance companies, who charge the employer premiums which vary according to the dangers and risks of his trade.

THE INSURANCE ACT WHICH HELPS PEOPLE TO HELP THEMSELVES

In 1911 the State took one of its most remarkable steps in protecting the individual. The National Health Insurance Act was passed to provide working people with help in sickness. This remarkable law provides that nearly all workers of sixteen and over, unless they are brain-workers earning more than £250 a year, are compulsorily insured in insurance societies approved by the State. This means that by far the greater number of people working for employers are insured against the disaster of loss of health.

The insurance is effected in a very ingenious way. Each insured person has a card, with a printed space for each week. The employer has to pay tenpence a week for each man, and ninepence for each woman, and this he does by buying stamps at the post office and sticking them on the cards. Of these contributions, however, the employee himself pays fivepence if a man and fourpence if a woman, and the employer is allowed to stop the fivepence or fourpence when paying wages. To these sums the State makes an addition for each insured person, so that the worker's insurance fund is made up of three distinct parts, paid respectively by the employer, the worker, and the State.

Thus insured, the worker can claim benefit if he falls sick. He has the right to free medical attendance by a doctor chosen by himself, and to weekly payments (15s. a week if he is a man and 12s. a week

for a woman) while he remains sick. If he falls into consumption he is entitled to special treatment in a sanatorium. Other benefits, such as dental attendance, are added as far as the funds of the societies allow.

HOW THE WORLD'S MARKETS AFFECT UNEMPLOYMENT IN BRITAIN

In another way, also, the State insures the worker, and that is against the grave risks of unemployment. In a country like ours, where so much industrial work is done, and where prosperity depends so much on the state of the world's markets, there is a good deal of fluctuation in work. In some years there is plenty of work for everybody, or nearly everybody, who wants it; in others there may be hundreds of thousands of men and women idle.

Unemployment Insurance does not cover so many workpeople as the Health Insurance, but it applies to all who are engaged in trades which suffer seriously from fluctuation. Here, again, the insurance fund is built up by contributions made by the employer, the worker, and the State, and certain money payments per week are made to the unemployed. In view of the special severity of unemployment after the war the payments were made more generous and continuous. The finance of the scheme is continually changing, owing to the serious unemployment caused by the war. In effect, the State seeks to maintain, with money payments, those workers who have the misfortune to lose work through no fault of their own.

The State also does its best to help workers to find work. In each town there is an Employment Exchange, which keeps a register of all the local people who are out of work; and through these exchanges the unemployment benefit is paid out. The unemployed can only get out-of-work pay by registering, and so the Exchange knows who is out of work, and is in a position to help without delay an employer who has work to offer.

THE STATE AS FAIRY GODMOTHER TO OLD AND INFIRM PEOPLE

When a poor man or woman grows old and reaches the age of seventy, the State again gives aid in the form of an Old Age Pension for those who have not enough money to live upon.

What of the poor citizen who comes to extremity of poverty before he is seventy? The State comes to his aid either in insti-

tutions which are called workhouses, or by granting payments which are called Outdoor Relief. The State lays down that if a destitute person applies to the Guardians for admission to the workhouse he must be admitted if his case is genuine. If he is sick he is sent to a special sick ward called the Infirmary. Workhouses owe their name to the fact that certain work must be done in exchange for the relief given.

We see that most of these forms of State aid that we have recorded apply to what are commonly called "working people," or to people who are poor. That, of course, is as it should be, because those who have good means obviously do not need a great deal of public assistance. Those, however, who have property or a good income do benefit greatly from the existence of the State. The Government of our country protects us all, rich and poor alike. It has its code of laws to protect a citizen from theft, fraud, or violence. The State will not allow a citizen's character to be defamed. If a well-to-do man dies leaving property, the law sees that his will as to who shall inherit his property is carried out. The State has even set up an official called the Public Trustee, so that anybody who has property can make sure of the proper carrying out of his will by appointing the Public Trustee to administer it.

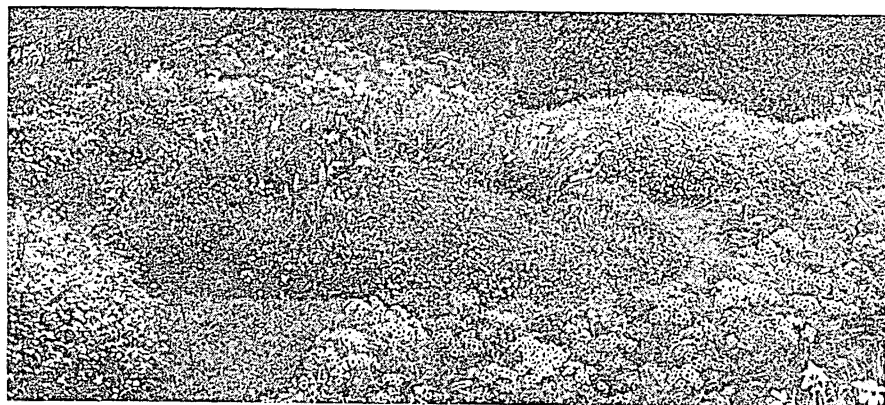
THE BIG BOOK OF FACTS ABOUT RICH AND POOR ALIKE

Finally, let us notice how the State, which takes notice of our being born, and writes the fact down in a book, also takes note of our getting married. Every marriage has to be registered, and a marriage certificate is issued recording the fact. The Marriage Registers are carefully preserved.

And so it is when the last scene of all comes, and we die. Again the big book of the Registrar records the fact. So that, whether we are high or low, great national figures or citizens of the humblest degree, the State writes down when we arrived in the world and when we departed from it. As time goes on, doubtless, the State will take more and more interest in what happens between our wonderful beginning and our wonderful end, for the degree of interest of the community in each of its members is a sure test of the worth and ultimate value of any civilisation.

It should be added, however, that in many directions voluntary assistance still plays an important part, though State control tends to increase as the years slip by.

The Story of the Marvellous Plants that Cover the Earth



FLOWERS OF THE GARDEN

WHEN we come to the flowers of the garden we are at once struck by three great differences between them and the wild flowers of the countryside.

In the first place their blossoms are, as a general rule, much finer and larger; in the second place their colours and patterns are much richer and more varied; and finally, the scent of those that have any odour is much more beautiful and pronounced. All these wonderful improvements—improvements, that is, from man's point of view but not from the plant's—have been brought about by the plant-breeder, who has selected those plants which showed signs of the qualities he desired, and has bred from them until he produced growths of that character.

As man took the wild sheep and, after domesticating it, improved it till he can now get thirty pounds of wool in a year from a merino sheep's back, and just as he took the wild cow and improved it till he can obtain 32,000 pounds of milk a year from one animal, so he took the rose and the lily and other wild flowers and from them bred the wonderful and beautiful varieties which we see and enjoy today.

Let us take the rose as an example. In all wild Nature there is no plant that produces a double rose. All the wild roses have only five petals, with a great

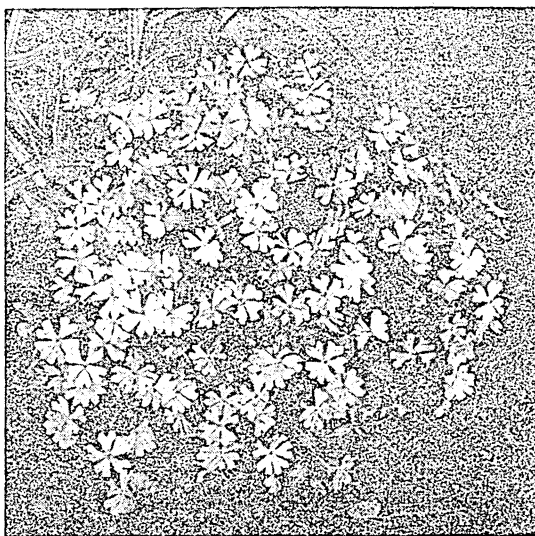
number of stamens, and several pistils. By patient care and coaxing over a long period the plant-breeder has persuaded the rose to turn nearly all its stamens into petals, and he has changed the colour again and again, so that now we have roses of almost every tint from white to yellow and pink to the very darkest crimson. He has not yet, however, been able to grow a blue rose. The nurseryman's catalogue contains a list of hundreds of varieties of garden roses and yet, beautiful as these flowers may appear, we must remember that they are really imperfect, for they have lost most or all of their stamens—that is, the male parts of the flowers. They have generally retained their pistils, or female parts, however, and when pollen is brought to them by the bees from wild roses they sometimes produce seeds, and these grow into plants with flowers, not like the garden rose, but more or less like the wild rose.

The plant-breeder's or gardener's method of producing new varieties of the rose is to watch out for a blossom that shows somewhat of the qualities of colour or form that he requires, and then to cut off the shoot that produced it and get it to take root. After it has grown into a little bush he cuts out a number of the shoot buds from the stems and fixes them in the skin

BOTANY & ITS WONDERS · FLOWERS · TREES · HOW THINGS GROW

of a wild rose. The wounds heal and the buds grow into shoots, when the gardener cuts off all the other shoots and buds of the wild rose and allows only the new parts to grow. Thus he produces a number of specimens of his new rose from the one little cutting which was induced to take root. Some of the shoots he probably gets to grow on wild rose stems, or "stocks," as they are called, and thus new roses are multiplied and made available.

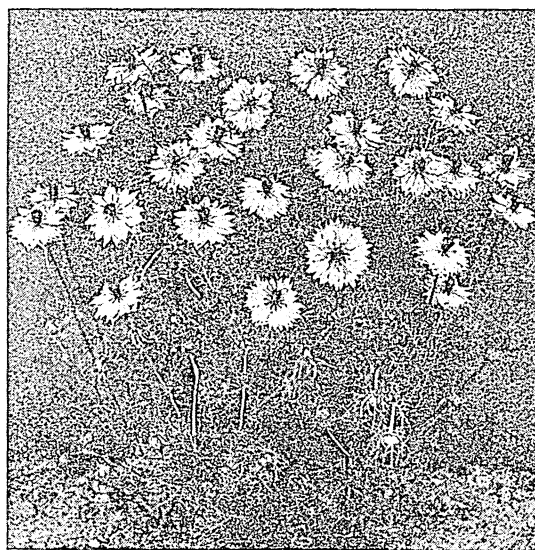
Practically all the families of wild plants have given us wonderful and beautiful varieties of flowers for our gardens. One of the most popular, the sweet pea, is now found in an almost endless variety of colour. It is a native of Sicily, and was first introduced into English gardens about two hundred years ago. Its structure is the same as that of our wild everlasting pea, but while that is a perennial—that is, a plant which lasts some years and flowers annually—and has its blossoms in clusters, the sweet pea is an annual, and bears only two or three flowers of greater beauty on each flower-stalk.



A CLUMP OF PINK SILENE, A COUSIN OF THE CAMPIONS



A BED OF NODDING DAFFODILS



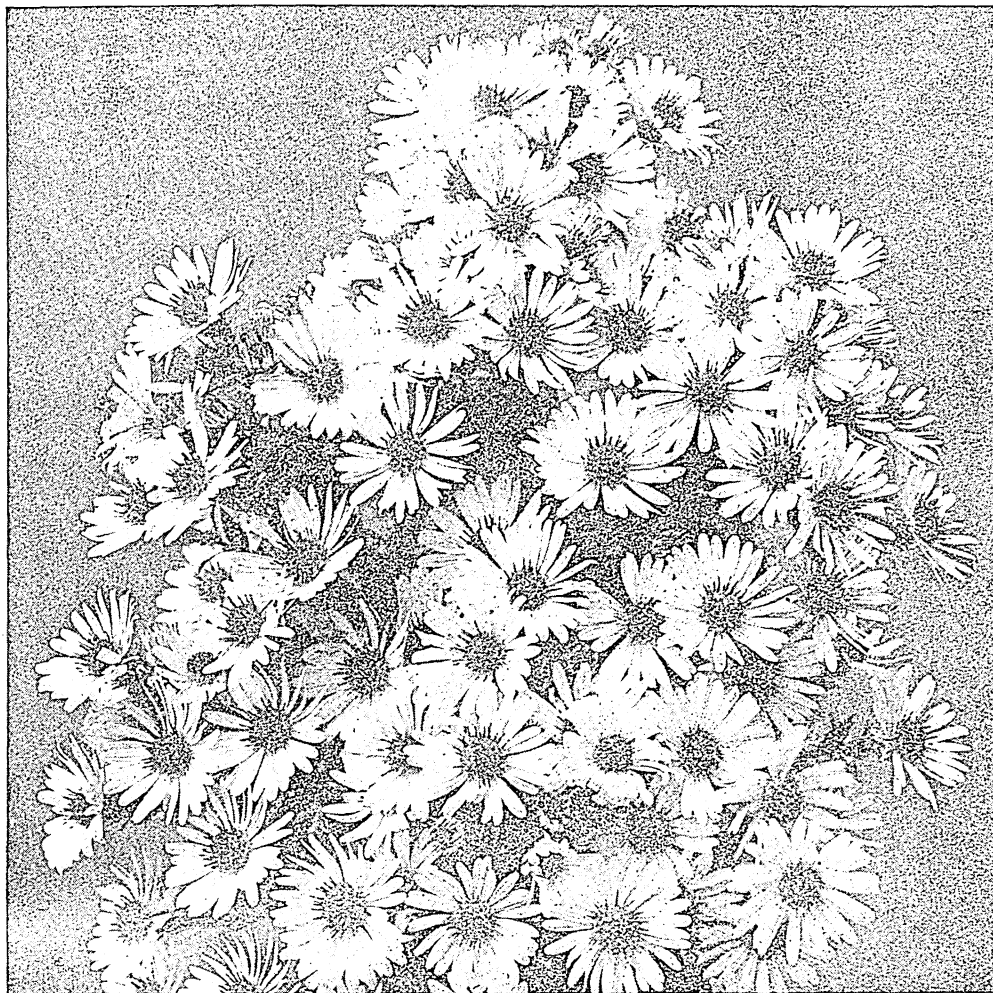
NIGELLA, OR LOVE IN A MIST

The wild carnation is a native of the countries round the Mediterranean, and was brought to England in the middle of the thirteenth century. From it have been produced many beautiful varieties for the garden, and though the wild blossom is always pink or lilac in colour, by careful selection and crossing, flowers of all kinds of delightful colour have been produced.

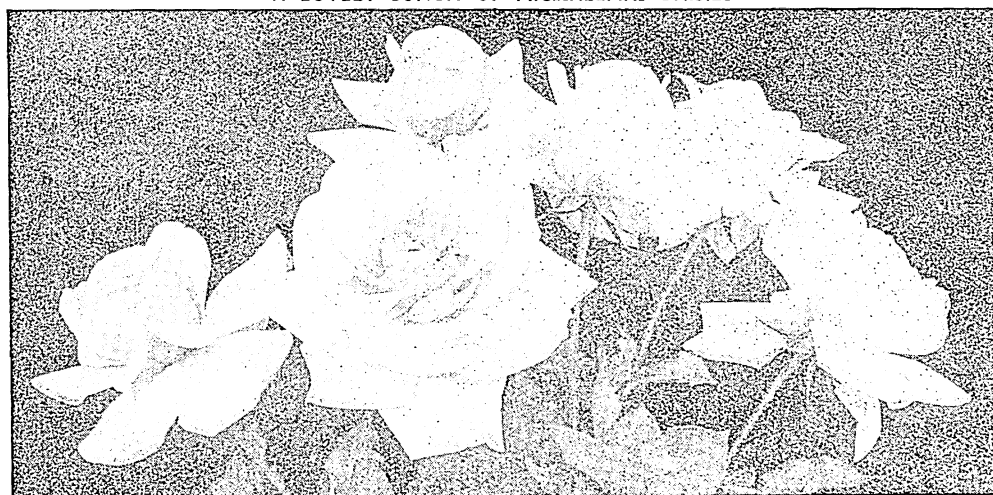
The garden geraniums, of which we have an enormous number yielding both beautiful flowers and beautiful foliage, have not been developed from the wild geranium of the English countryside. These garden plants are really pelargoniums, and their ancestors were originally introduced from South Africa. English gardeners have wonderfully improved and multiplied the varieties, but they are all too tender to stand our British outdoor climate in winter, and that is why we have no wild pelargoniums. The wild geraniums or crane's-bills are near relations of the pelargoniums.

Garden stocks are cultivated forms of plants which grow wild in southern Europe

TWO BEAUTIFUL ENGLISH FLOWERS



A LOVELY BUNCH OF MICHAELMAS DAISIES



THE BEAUTIFUL ROSE OF OUR ENGLISH GARDENS, WHICH HAS BEEN CULTIVATED FROM
THE WILD DOG-ROSE

The pictures on these pages are reproduced by courtesy of Messrs. Sutton and others

and are members of the family to which our wallflower belongs. The buttercup family has given us many beautiful garden flowers, including the various forms of clematis, larkspurs six feet high ending in a long thick column of brilliant blue flowers, Japanese anemones, columbines, and peonies.

One of the most wonderful results of the plant breeder's work is the enormous range in colour and pattern of the pansies and bedding violas which have all been produced from the little wild heartsease of our fields and commons. The graceful fuchsias have been developed from a plant that grows wild in South America.

THE PLANT WIZARD OF AMERICA AND HIS WONDERFUL WORK

The magnificent lilies which we see used for church decoration, and other varieties grown in our gardens, are vast improvements on the wild varieties from which they have been produced; and this is equally true of the beautiful and fragrant hyacinths and daffodils, the showy irises, and a thousand other varieties of garden flowers, all obtained by long and patient selection and breeding from wild flowers which are sometimes quite magnificent in appearance.

The greatest of all plant-breeders is Luther Burbank, often described as the American Plant Wizard. His work in producing stoneless plums, and walnuts with thin, paper-like shells, and so on, is described elsewhere. But he has also performed miracles in the realm of garden flowers, and De Vries, the great Dutch botanist, himself a wonder-worker in the realm of plant-breeding, has said of Burbank: "He has already accomplished in his chosen line of life more than any other man who has ever lived. Indeed, when the full sweep of all his achievements shall finally come into view, it may not be unfair to say that not all the plant-breeders who have preceded or accompanied him have done so much for the world. He has done more in a generation in creating new and useful types of plant-life than Nature, unaided, could have done in a millennium."

HOW A RICH PERFUME WAS GIVEN TO A SCENTLESS FLOWER

One or two examples of his work on garden flowers may be quoted. After long search he found a calla that had a very faint but appreciable perfume, and by carefully saving its seed and watching

the development of progeny from it, mostly odourless, he at last produced a calla that had a rich perfume.

He took a Californian poppy, a flower that is generally orange, but in this rare case had a thin faint line of crimson running up the centre of one petal, and from it produced, after much patient labour, a beautiful crimson Californian poppy named by the botanist Eschscholtzia. He took a red Shirley poppy which lacked a little of its usual colour, and from it produced a blue poppy.

But not only by selection did Luther Burbank work. He did wonders by hybridisation, or crossing one plant with another. He crossed the little ox-eye daisy of the eastern United States with the European daisy and produced a large and graceful flower. Then, to make the blossom whiter, he crossed the hybrid form with a Japanese daisy that had a flower of dazzling whiteness, and as a result obtained a white daisy with flowers nearly six inches across. This was named the shasta daisy, and is to all intents and purposes a new species. But Burbank was not content, and, by selective breeding, he produced very many varieties.

MILLIONS OF NEW FLOWERS THAT ARE BORN AND DESTROYED

Thus the number of garden flowers is constantly being added to. In producing these new and beautiful flowers hundreds of thousands, indeed millions, of varieties are born and destroyed. Luther Burbank, for example, in experiments with lilies used to plant from one to three pounds of hybridised lily seeds every season, and at one time had half a million kinds of lilies all waiting to unfold their petals for the first time. It was no vain boast when he said, "Search the Earth all over, climb every mountain, plunge into every canyon, valley and jungle; and, when all this is done, visit every park, garden, nursery, and conservatory; go anywhere, everywhere, and as many varieties of charming lilies cannot be found as I have produced. All the Earth is not adorned with so many new ones as are growing at my establishment." No wonder, with all the work he has done in creating new fruits, flowers, and vegetables for America and the world, and especially for his adopted state of California, that the schools of that State celebrate his birthday as a general holiday.

Pictures of Flowers of the Garden
appear in Chapter 52 of Group 10.

The Story of the Peoples of All Nations and Their Homelands



The city of Aleppo in Syria as seen from the citadel

THE DESERT PEOPLES

MESOPOTAMIA · ARABIA · PALESTINE · SYRIA

MESOPOTAMIA is a new nation, achieving its independence through the Great War, and established as an independent State under the guidance of Great Britain, according to a Mandate from the League of Nations. A large majority of its people are Arabs, who before the war had long been under the rule of the Turks. The land is one of the most famous in ancient history, and was once the seat of the most powerful nation in the world.

Mesopotamia, which the inhabitants now call Iraq, but which most of us will still call by its ancient and historic Bible name, means "the land between the rivers." Those rivers are the Euphrates and the Tigris, both rising in the Turkish province of Erzeroum. After a widely wandering course by the Euphrates, and a more direct and rapid course by the Tigris, they meet in the southern part of the great Mesopotamian Plain, about 70 miles from the Persian Gulf. The length of the Euphrates is 1800 miles, and the length of the Tigris about 1150 miles.

These rivers, used properly for irrigation, are capable of fertilising the plain and supporting a large population. In the distant past the country was fertile and prosperous, and contained great and

wealthy cities. But until within the memory of people still living the very sites of these cities had disappeared. The old systems of irrigation have fallen into decay and disuse, and in 1920 the people of this country, three times as large as England, only numbered 2,850,000.

One of the principal ambitions of Germany, when she began the war, was to use Turkey as an entrance to the Mesopotamian Plain and to reach the waters of the East by rail to Koweit on the Persian Gulf. For these reasons she induced the Turks to join in the war on her side. But the British armies, with powerful support from India, forced their way up to Baghdad, the capital of the country, on the Tigris, and were received as deliverers by the Arab population.

The Turks had never been more than a small if conquering minority of the inhabitants, and the object of the British was to establish a firm, independent, popular Arab Government. In August, 1921, Feisal, son of the King of the Hejaz, was elected king, and British support was continued. The Turks had advanced a claim to reoccupy Mosul, on the upper part of the Tigris, opposite the site of Nineveh, an important city with 90,000

THE FIVE CONTINENTS & 100 NATIONS & RACES THAT INHABIT THEM

COUNTRIES

people, a centre for several trade routes, and the question remained unsettled in July 1924. The Mosul district has rich supplies of oil.

Baghdad, which has about 170,000 people, was in the days of the Caliph Haroun-al-Raschid the most famous city of the East, and it is still regarded as the home of Eastern romance. Basra, with about 90,000 people, is the seaport at the head of the Persian Gulf. Trade has revived considerably since Baghdad came into touch with the business energy of the West, and there is a regular air service from Cairo, as well as a motor service from Damascus.

OLD WORLD HISTORY REVEALED IN A LANGUAGE OF 6000 YEARS AGO

The early history of Mesopotamia that comes to us in the form of writing takes us back 6000 years. Only Egypt has as early a record. The Sumerians and Akkadians, a people probably of Mongol origin, occupied the plain and brought it into a state of fertility. Their language, which had a resemblance to Chinese, has reached us through their conquerors, a Semitic race resembling the Arabs and the Jews. The newcomers mixed with the Sumerians and the united races formed the powerful country which had as its capital Babylon, on the Euphrates.

The picture-writing of the Sumerians was gradually condensed into the cuneiform writing of the Babylonians, of which fine examples may be seen in the British Museum, on baked clay tablets of the shape of a cake of soap. The writing looks as if tin tacks had been pressed into soft clay tablets and the marks made had been baked in. But these wedge-shaped signs and arrow-heads make up an alphabet in which histories, legends, laws, records, and business arrangements are written. The writing was pressed into wet clay tablets or cylinders by a stylus, or blunt pen, and when the tablets were baked they remained unchanged for thousands of years in the dry climate of the East, buried under the sand amid the ruins of ancient cities that have crumbled into shapeless mounds.

THE MAN WHO STOOD ON A PRECIPICE TO COPY AN INSCRIPTION

Now they can be read we can learn more about the people of ancient Babylon than our forefathers ever imagined.

This cuneiform writing was eventually deciphered in much the same manner that Egyptian writing was read through finding

three languages saying the same thing on the Rosetta Stone. Sir Henry Rawlinson, travelling in Persia, saw on a high rock at Behistun an inscription in three languages. The rock was so high that he could not reach it by ladders from below, but he had himself slung down from above, and then with great difficulty obtained a squeeze of the inscription—that is, he pressed damp paper against the letters so that they appeared raised on the paper. This he brought away for study by men who knew the other two languages, and from them they gradually learned how to read the third unknown language. This language was not only written by the Babylonians, but by other nations around, such as the Assyrians, and the Hittites in Asia Minor.

The Assyrians were a very warlike people living in the hills to the north of the Babylonian plain which we now call Mesopotamia, and presently the Assyrians descended into the plains and conquered the Babylonians. The cuneiform writing spread far and wide over the East and even reached Egypt, though not for general use. One of the Egyptian kings, at a time when Egypt was a conquering power, extended his rule far into Asia, and married a lady whose people used the cuneiform writing, and her son set up a new temple on the banks of the Nile in honour of his mother's god, which represented the Sun.

LIGHT THROWN ON THE MANNERS AND CUSTOMS OF PEOPLE IN THE PAST

Centuries afterwards an inscription in the arrow-head writing was discovered in Egypt in what are called the Tel-el-Amarna tablets, so named from the place where they were found.

For some centuries Assyria, with its capital at Nineveh on the River Tigris, was the leading Power in western Asia. Some of the most famous statues and sculptures in the British Museum were dug out of the ruins of Nineveh, in the nineteenth century, by Sir Henry Layard and other excavators, and all these discoveries increased our knowledge of the language and the life of the nations which inhabited Mesopotamia in the far-off past.

In this way we know of the doings of the great kings of the East who were conquerors and lived in magnificent style. Some were wise law-givers, and some lovers of learning who had libraries written on clay tablets preserving earlier history, besides telling of the glories of their own conquests. One of the wisest of these

TYPES OF EASTERN PEOPLES



TYPE OF A CITY ARAB
IN PALESTINE



A SAMARITAN HIGH PRIEST
OF NABLUS



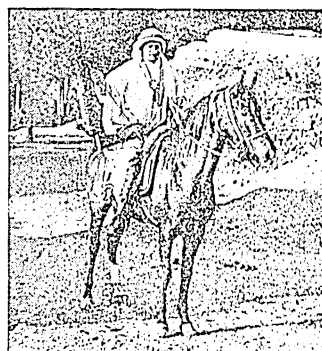
A LITTLE WATER-CARRIER
OF NAZARETH



A SCHOOL FOR SMALL BOYS IN THE COAST VILLAGE OF LOHEIYA IN ARABIA



A WELL-FILLED BOAT ON THE
TIGRIS AT BAGHDAD



A BEDOUIN SHEIK
OF SYRIA



JEWISH TYPES AT THE
WAILING PLACE, JERUSALEM

kings was Hammurabi of Babylon, more than 2000 years before Christ. He drew up a code of laws about the time when Abraham's father was leaving Ur of the Chaldees in Mesopotamia and moving with his flocks and herds into southern Syria, on his way towards Palestine, where the founding of the Jewish race began.

Some of the laws adopted by the Israelites when Moses organised them into a separate nation are found on the stone pillars which Hammurabi set up in different parts of his dominions that people might read for themselves the laws which they had to obey. A cast of one of Hammurabi's pillars may be seen in the British Museum. Hammurabi's laws, the oldest known, are for the most part wise and practical, and show the Babylonians to have been an industrious and civilised people.

Sennacherib, the Assyrian king mentioned in the Bible as failing to take Jerusalem from King Hezekiah, his army being destroyed by pestilence, was a son of a great king Sargon, and had an even more famous grandson, Ashurbanipal, who founded one of the most famous libraries in the world. He sought for copies of the old Babylonian books in the libraries and temples of the ancient cities, and had them copied, translated, arranged, and catalogued. He also had additional annals written. This is how he described this part of his life's work :

I have written upon tablets the noble products of the Scribes which none of the Kings which have gone before me had learned. I have arranged them in classes, revised them, and placed them in my palace that I, even I, the ruler who knoweth the light of Ashur, the king of the gods, may read them.

From this library we have accounts of the creation of the world, and of the Deluge, resembling the accounts given in the book of Genesis. There are also in it stories and fairy tales, hymns and prayers, and countless letters of business. It was soon after the time of Ashurbanipal, the great book-collector, that the Medes from

northern Persia, helped by an unfaithful Assyrian general, besieged and destroyed Nineveh. The Assyrian general, Nabopolassar took Babylonia—that is, western and southern Mesopotamia—as his share of the spoil and started a new Babylonian Empire. It was his son Nebuchadnezzar who took Jerusalem, blinded the Jewish king, and carried his people away captive into Babylon, as the Assyrians had carried away the northern Israelites 137 years before. Nebuchadnezzar made Babylon a most magnificent city. Nabonidus, who followed Nebuchadnezzar, was a zealous antiquary and historian. During the reign of his son, the Belshazzar of the Bible, Babylon surrendered to Cyrus, the Persian conqueror, who allowed the captive Jews to return to Palestine. Both those who returned and those who stayed in Babylon learned much from the Babylonian store of knowledge. The Jews had become a bookish people, and they went home to Jerusalem to write their own history.

After the Babylonian rule was destroyed by Persia came the Greek domination, followed by Rome's more nominal rule, for Rome never reached the people of the Near East with as personal an appeal as Greece had had through her language, the vehicle of lasting literature. Then Asia, from the Black Sea to the borders of India and afterwards beyond those borders, was swept by Mohammedanism, and its practice of conquest. First it was Arab conquest, which centred itself on Baghdad about the time when Charlemagne, in the same spirit, was raising a defence for Christianity in the West. A cross current of conquest was the incursion of the Turks.

Thus we see that the Mesopotamian Plain has played continuously a notable part in the great movements of nations. In it lived the most aggressive nations of antiquity for 3000 years before Christ. It revived under Arab Mohammedan rule, but sank back into stagnation under Turkish indolence. Once more, however the Arab appears to be coming into his own.

ARABIA AND ITS PEOPLE

The new tendency of the Arab race to recognise its own existence is observable in the formation of the Kingdom of Iraq occupying the Mesopotamian Plain ; in the acknowledgment of distinctive Arab rule in Transjordan, the " beyond Jordan " part of the region governed under the League of Nations Mandate accepted by

Great Britain ; in the desire of the Arabs of Palestine to have a fuller share in the government of that land ; and in the acknowledged independence of the Kingdom of the Hejaz, which contains the chief Holy Cities of the Mohammedan faith.

Whether the movement will become more general still is a question as difficult

THE DESERT PEOPLES

as it is interesting. We shall see that this is so if we look at the vast homeland of the race—Arabia.

The Arabian peninsula, whence the race has spread as far as the borders of Persia and Turkey, and over considerable areas of Africa, has an extent of more than a million square miles. That is, it is twenty times as large as England. Its population does not exceed five millions. Though nearly the whole of the Arabs in Asia outside of Arabia are concerned in the movement for Arab self-government, not one-fifth of the Arabs in Arabia have participated in it.

The reason is plain. They have no need for action as a race. They are separate tribes, each living in its own part of a wide land that bars them from each other by deserts or mountains, and, when the Turkish intrusion disappeared, they had no reason to fear any loss of liberty through foreign aggression. They are grouped under their own sheiks, who, where a number of tribes make up a kind of provincial unity, pay tribute to the most powerful sheik in the group. He calls himself an Imam, or an Emir, or a Sultan, or a King. In this way Arabia has more than a dozen loosely compacted States, within not very clearly defined desert boundaries, and politics means to them their relations with neighbouring Arab States living beyond intervening deserts.

THE BOND OF KINSHIP BETWEEN THE NATIVE PEOPLES OF NORTHERN ARABIA

As two thirds of the Emir-governed States are round the coast, and Arabian trade is largely in British hands, the British have friendly relations with the most important Arab rulers, whom they support with subsidies of varying amounts. Thus British influence is felt throughout a great part of Arabia, though it is not a controlling influence. The Arabs feel most strongly the bond of racial kinship round the north of the peninsula, where they abut on other nations, as on the French Mandate control of Syria, Turkey on the Mesopotamian border, and, on the east, Persia. It is here that they are self-conscious as a race, and are now governed under the kingship of Hussein in the Hejaz, the kingship of his son Feisal in Mesopotamia, and the Emirship of Abdullah, another son of Hussein, in Transjordan.

The Arabian peninsula, from the Gulf of Akaba, north of the Red Sea, separating it from the peninsula of Sinai, is skirted

along the whole eastern shore of the Red Sea by a range of mountains lying back about a day's journey from the coast. The coast runs north-east and north to the State of Oman, where the mountains again reach a height of 10,000 feet; but when the coast of the Persian Gulf is reached the shore becomes low and marshy.

THE CARAVAN AND PILGRIM ROUTES THAT CROSS THE DESERT WAYS

Thus western and southern Arabia are ringed round by mountains which have their steep side towards the sea, but on the inward side only fall 2000 feet or less and merge into a lofty plateau that sinks gradually to the north. The habitable part of Arabia is its mountain region, for a varying distance up to 150 miles inland.

The whole inland southern part of the plateau is soft, sandy, waterless desert, uninhabitable, even by Bedouin tribes, though in the spring verdure appears, and for short periods herds may graze the fringe of "the empty land," as it is called.

In the middle of Arabia, however, where there are watercourses, dry except during the infrequent rains, with oases here and there, and wells at long distances, there are a number of caravan routes used for trade and for pilgrimages between the Hejaz and the northern part of the Persian Gulf. Here formerly was the central Arabian Empire of the Wahhabis, founded by Mohammed Abdul Wahhab, a Mohammedan reformer. Wahhab's idea was that the Arabs should return to the purity of the Mohammedan faith as it was in Mohammed's day, but the people became intolerant and cruel, and travel in that region became impossible for those who were not Mohammedans. Now the States of Nejd, in the middle of Arabia, and Hasa, on the Persian Gulf, are under one Emir, and form the next most powerful Government in Arabia to Hejaz in the west and Oman in the east.

THE FAMOUS CITIES THAT LIE BURIED IN THE SANDS

Farther to the north is the Bedouin State of Jebel Shammar, and north of this is the great desert of Nefud—the Red Desert—which, beyond the little town of Jauf, merges into the great stony desert of Syria, separating Damascus from the plain of Mesopotamia. These northern deserts are thinly occupied, in their less inhospitable parts, by nomadic Bedouin tribes. Travel, over the interior routes of Arabia, depends on the camel, which not only

COUNTRIES

is the means of transport but often by its milk provides drink for both men and the horses which the wealthier Arabs use chiefly to add to their dignity. Next to the camel the ass is the chief beast of burden.

This is the country, edged round by mountains except on the north, and filled in its lofty centre with deserts, that gave birth to the Mohammedan religion, now believed by two hundred millions of mankind. There is no doubt it was much more prosperous in the distant past than it is now. Just as on the Syrian plain in the north—now desert—there were great cities, like Palmyra, so in southern Arabia there are signs of vanished greatness. Arabia is drying up more and more. The sands of the great southern desert creep steadily forward. Under them are buried cities once flourishing and famous. Some day, when the Arabs of the interior are less suspicious and unfriendly, men will dig the Arabian sands and possibly find historical records of which the world is now ignorant.

THE SHELTERED VALLEYS AND OASES WHERE THE DATE PALMS GROW

In south-western Arabia was the favoured land of the Queen of Sheba, whose gold adorned the Temple of Solomon. The country around, what we now call Yemen, once was the fabled "Araby the Blest," or Arabia Felix, happy Arabia. Yes, Arabia has gone backward. And yet, in its choicer parts, it is not unblest. Wherever there is water there is fertility. Though on its low-lying coasts it is perhaps the hottest part of the world, if we follow up the valleys that cleave its lofty coastal ranges, not far from the parched seaport of Aden, we shall find, as we ascend to the cooler heights, that there are mountain springs whose bubbling waters are treasured as if they were the fabled nectar, and the mountain sides are terraced to preserve the soil. There grow all the most delicious fruits, the trees that yield the once famed spices of Arabia, and coffee plants which give such coffee as no other place in the world can produce. In the sheltered valleys and oases the date palm flourishes, and the sustaining date becomes the staple food of both man and beast. But such places are few, and over the land is a general feeling of decline and a shrinkage of the fertility that once prevailed. Arabia has little now which it can sell to the world that it may purchase the things which it most sorely needs. Dates, hides, wool, and gum, coffee, horses, and,

from the Persian Gulf side, pearls are almost the only products it can offer.

The Hejaz is not only the most important part of Arabia historically, because it is the region where Mohammed lived and attained an influence that has been felt throughout the East ever since, but also because it has been the source of Arabia's modern revival.

THE RAILWAY THAT LINKS THE OLD CITIES OF DAMASCUS AND MEDINA

In 1916 Hussein Ibn Ali, the Sherif of Mecca, proclaimed his independence of Turkey, and he and his sons gave useful assistance, beyond Jordan, during the decisive advance of General Allenby on Jerusalem and Damascus. After the war Hussein's kingship of the Hejaz was acknowledged by the Powers.

The railway from Damascus to Medina, used by Turkey to garrison the Holy Cities of the Moslem world, runs through Transjordan, part of the mandated territory of Palestine, and a province of the Hejaz, in which are the towns of Akaba and Maan, now added to Transjordan. Then it continues past El Akhdar and El Ala to Medina, but it has not reached Mecca.

The population of the Hejaz is about 900,000, of whom 70,000 are in the capital, Mecca, the supreme goal of Mohammedan pilgrimage. Jiddah, the port of Mecca, two days journey distant from it, has a population of 20,000. Yambu is the port for Medina, which is Mohammed's burial place, and second only to Mecca in sanctity, as seen by the Moslem world.

The highland province of Asir, south of the Hejaz, has now been extended to the port of Hodeida, which has 40,000 people. Its capital is the small inland town of Sabiyah. Asir is estimated to have a population of a million.

THE COUNTRIES THAT CAN ONLY BE REACHED BY DESERT WAYS

Yemen, the most fertile province in Arabia, has, by local war, been restricted in size. It is extremely mountainous. Its population is estimated at a million. The capital is Sanaa, with a population of 25,000, beyond the central mountain range. Mocha, the port once famous for its export of the coffee of the province, has declined, as the trade now finds its outlet through Aden.

Aden, a strong fortress, port of call, and trading centre for southern Arabia and East Africa, is administered from Bombay as an Indian outpost. It has been occupied

THE DESERT PEOPLES

by the British since 1839, and its protectorate extends eastward through the Hadramaut district to Oman. The population is about 55,000. The tonnage of its shipping exceeds three millions annually, and its annual trade is over ten million pounds in value.

Oman has Muscat as its capital, with 20,000 inhabitants, and is an independent State under a Sultan, who is subsidised by Britain. The population is about half a million. The trade is chiefly with India. Dates are the chief product. Camel breeding is specially important inland.

The Bahrein Islands, in the Persian Gulf, off the Arabian coast, governed by an Emir, form a protectorate under the Indian Government. The population is about 110,000. Bahrein, the largest, is a centre for a valuable pearl fishery. It is also a busy trade depot, nearly the whole import trade of central Arabia passing through it to the interior.

The central Arabian Emirate of Nejd and Hasa has an estimated population of

400,000. Riyadh, with 20,000 people, is the capital of Nejd, and El Katif, on Bahrein Bay, in Hasa, is the chief port.

The State of Jebel Shammar, north of Nejd, has a population of 250,000. Hail is its capital, with about 12,000 people.

The port of Koweit, with 50,000 people, on the Persian Gulf, near the frontier of Mesopotamia, is governed by a Sultan under British influence, and, according to the original plan of the Baghdad railway, will be its terminus when it reaches the Eastern seas. It is well situated as an inlet for Arabian trade.

It will be seen that Arabia is a land of scattered States, nearly all coastal, with little unity. Behind them are a few inland States little known and only to be reached by desert routes. But the Arab is naturally a traveller, and he shows it not only on land but by primitive seafaring, for his sailing boats venture far down the African coasts, and even as far as the East Indies. Like the early navigators of Western Europe these Arab seamen are daring and resourceful.

PALESTINE AS IT IS TODAY

One of the strangest developments of the Great War in its later stages was the important part played by the Holy Land. Palestine, sacred to all the faiths that have had their rise in the Near East, was the land where the war reached a decision. It was the capture by the British of this ancient country, held in reverence by the heart of the world, that finally convinced the war-makers that their plans had utterly failed. General Allenby there finally broke down the Turkish resistance and the allies of Germany fell away from her one by one.

As part of the Peace Settlement it was resolved by the Allied Powers that the world should take Palestine under its guardianship and establish it as a self-governing State. Accordingly a Mandate was allotted to Great Britain with a view to the Holy Land being regarded as "a national home for the Jewish people without prejudice to the civil and religious rights of existing non-Jewish communities."

A scheme of government was accordingly drawn up whereby it was hoped that the large Arab population, and the considerable Jewish and Christian populations, would unite to work an enlightened system of self-government just and tolerant to all. Sir Herbert Samuel was appointed High Commissioner, and for the wise

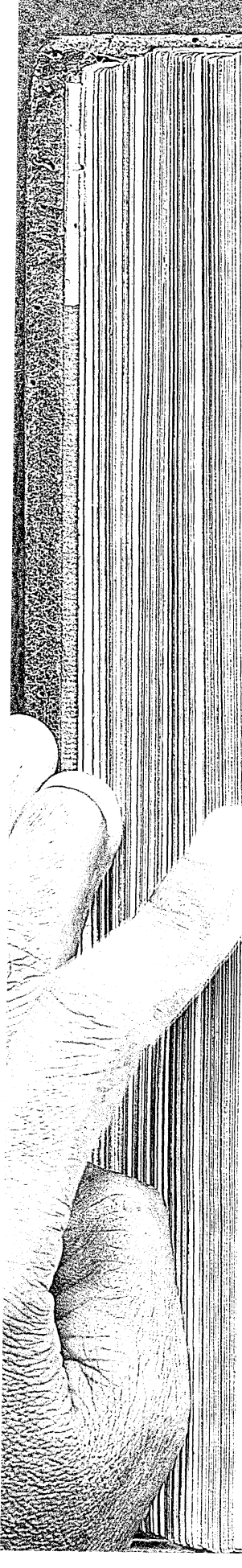
government of the country Great Britain became responsible, under the League.

The population of the territory in 1922 was 757,182. Of this number 590,890 were Moslems, 83,794 Jews, and 73,024 Christians. Arrangements were made for the election of a Legislative Council, and meantime an Advisory Council was formed to assist the High Commissioner.

The country has been peaceful. The value of its trade increased 40 per cent in three years. Improvements were introduced in extension of railways, sanitation, education, and other public services. Mohammedan opinion, however, remained suspicious of Jewish influence, and designs and plans for securing national unity in popular government remained in abeyance.

Palestine under the mandatory government does not include the whole of either the Old Testament countries of Israel and Judah or the New Testament area. A small part of northern Galilee, and of the northern country beyond the Jordan, has been included in the French mandatory territories of Syria and Lebanon. But there has been an addition in the south, where Gaza becomes the centre of a Palestinian district.

The area is about 9000 square miles. There are 80 Jewish colonies in different parts of the country, in which 18,000 Jews



COUNTRIES

are settled. The Arab villages number about 750 in all.

The country is arranged in four districts from north to south, namely, Galilee, with the port of Haifa, having a population of 25,000, as its chief town; Samaria, whose chief town is Nablus, with a population of 16,000; Judaea with Jerusalem, 63,000; and the southern district, Gaza, 17,500. Other present-day populations are Jaffa, 48,000; Hebron, 16,600; Nazareth, 7500; and Bethlehem, 6600. Jerusalem, of course, is the capital, and the centre of government for the whole country.

The products of Palestine for export are oranges, melons, wheat, barley, almonds, wine, and olive oil. Soap is manufactured for export, and tobacco is grown. Goats, sheep, and camels are the most numerous animals. There are 660 miles of railway open for traffic.

Though Palestine is a land of rock and wilderness in parts, and its one considerable river, the Jordan, runs through such a deeply cut valley that it is useless for irrigation, the country in many districts is capable of cultivation to a high standard of fruitfulness. It might conceivably sustain a population of two millions. More could not be expected, however scientifically the land's resources were

developed. It could never, therefore, be a national home for more than a fraction of the Jewish people, who now number twelve millions.

The truth respecting the Jews and Palestine is that while the genius of that intellectual people, and the intensity of their religion, have associated them for ever with the country they once ruled, their possession of it was only brief in comparison with the length of time they claim as their history. Their forefathers must have entered the land about 3000 years ago, but their tenure of it as their own, in independence, did not last 500 years; nor were they distinctively associated with it in any way except memory for more than 1000 years. It was not till the reign of David that Jerusalem was taken, and in less than 500 years the greater part of his race were in exile. Yet, so deep is the impression they have made on the religions of the world through the literature they produced in Palestine, that no other Palestinian history except theirs holds the world's attention. Already we have traced the outlines of that history in our stories from the Bible. It is what has been in "those holy fields," not what is, or is likely to be, that matters most gravely to mankind.

SYRIA UNDER THE LEAGUE

When the war closed the French felt they had a right to some mandated territory from the Turkish Empire, and especially the Lebanon region, where they had long had "interests." It was agreed among the Powers that they should have the province of Cilicia and the Lebanon district, and that the Emir Feisal, who had taken part in the war against the Turks, should rule in Syria proper, with Damascus as his capital, under a mandate controlled by the French.

The Syrian people, however, coveted independence, and at a Congress held in Damascus proclaimed the country as self-governing. Thereupon the French advanced into the country and seized Damascus, the Emir Feisal withdrawing. Since then France has handed Cilicia back to Turkey, and is now governing Syria and the district of Lebanon under a mandate from the League.

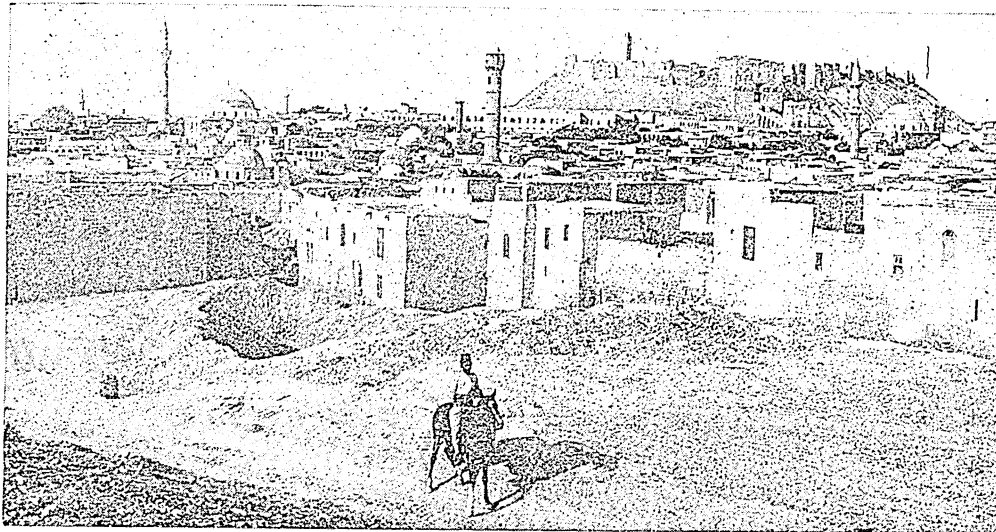
The capital from which both these States are governed is Beyrout, with a population of 80,000; but Damascus, with 170,000 people, is the most important

and interesting city, and the natural capital of the country. Other large towns are Aleppo, with a population of 140,000; Homs, 60,000; the port of Tripoli, 30,000; the ancient city of Antioch, 30,000, so closely associated with the early spread of Christianity; and Latakia, which produces a special tobacco, largely used for blending purposes, 20,000.

Syria has a population probably of three millions, and the Lebanon district 630,000. The products are most kinds of cereals, fruits, and vegetables, cotton, silk, and valuable tobacco. Damascus has a long and historic repute for fine metal work, Damascened sword-blades being famous for quality and finish.

Syria has an usually good supply of railways. Had the Arab community been able to retain Syria as a self-governing State it would have immensely strengthened the cause of Arab revival, as in the urban communities of this region they would have had a type of citizens they lack in the less-advanced Arab countries more remote from Western civilisation.

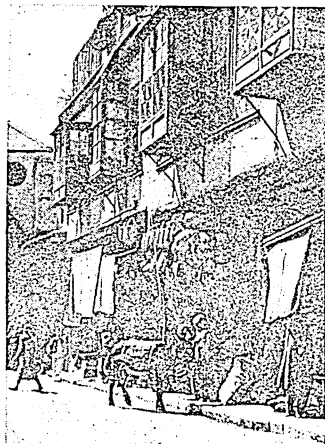
SYRIA · MESOPOTAMIA · PALESTINE · ARABIA



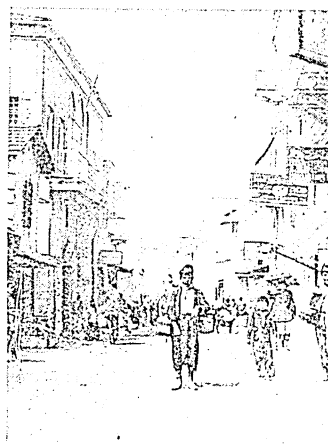
THE CITADEL TOWERING ABOVE THE CITY OF ALEPPO IN SYRIA



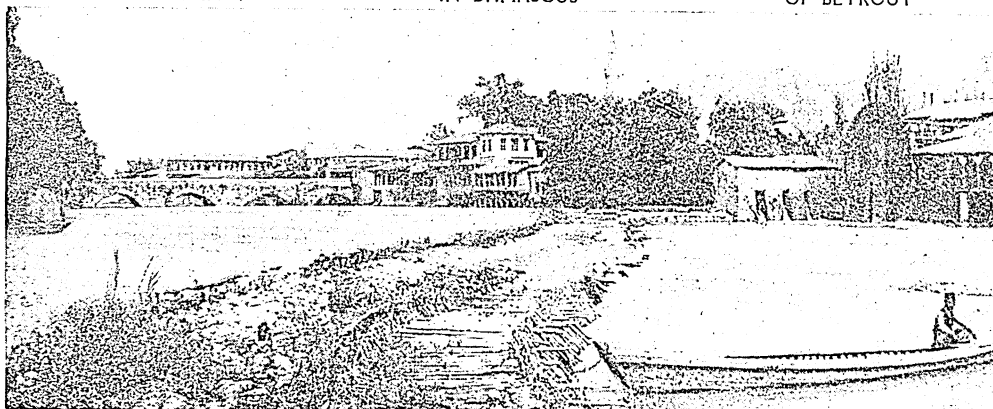
THE KADISHA TORRENT ON
MOUNT LEBANON



A BUSY STREET
IN DAMASCUS



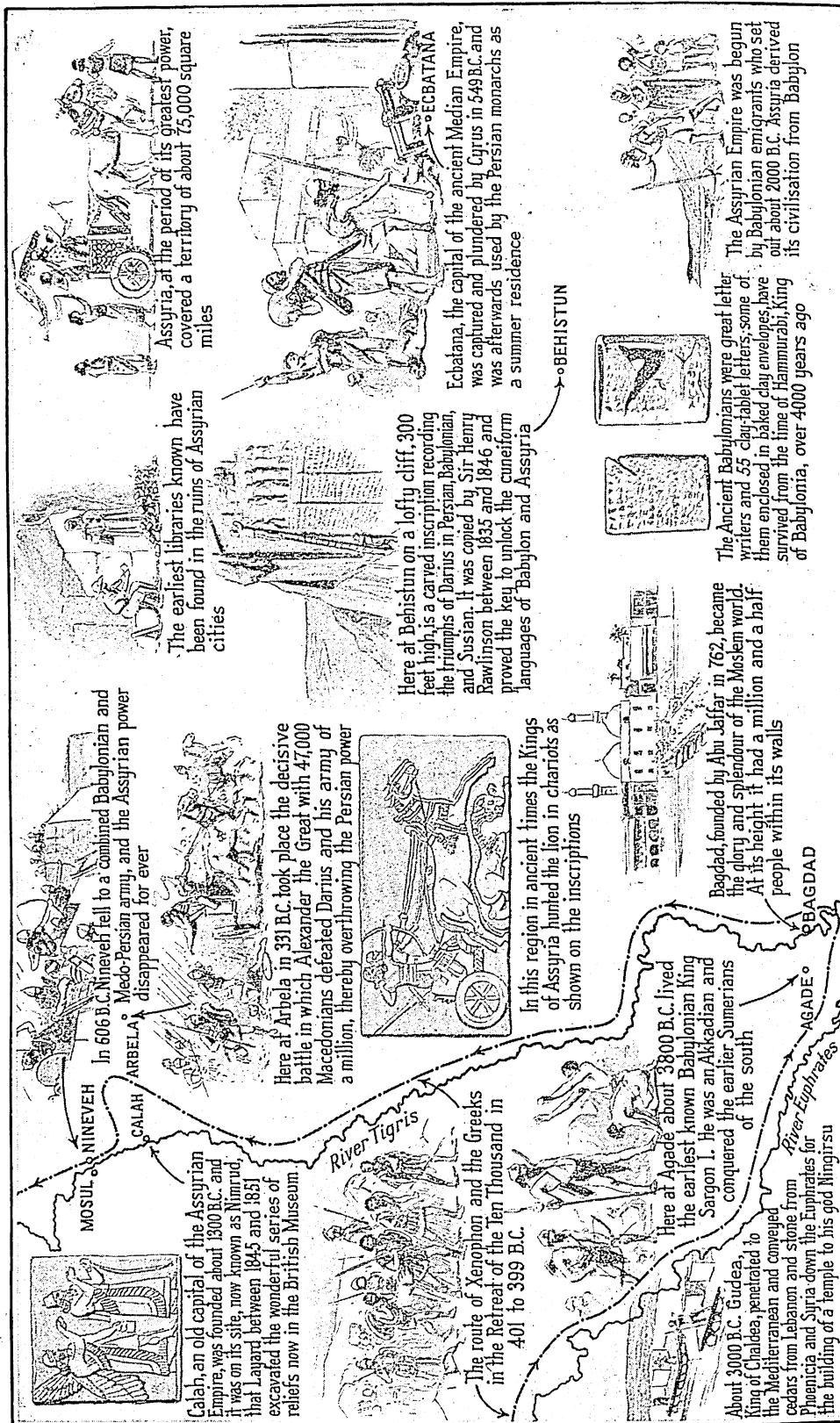
THE EUROPEAN QUARTER
OF BEYROUT

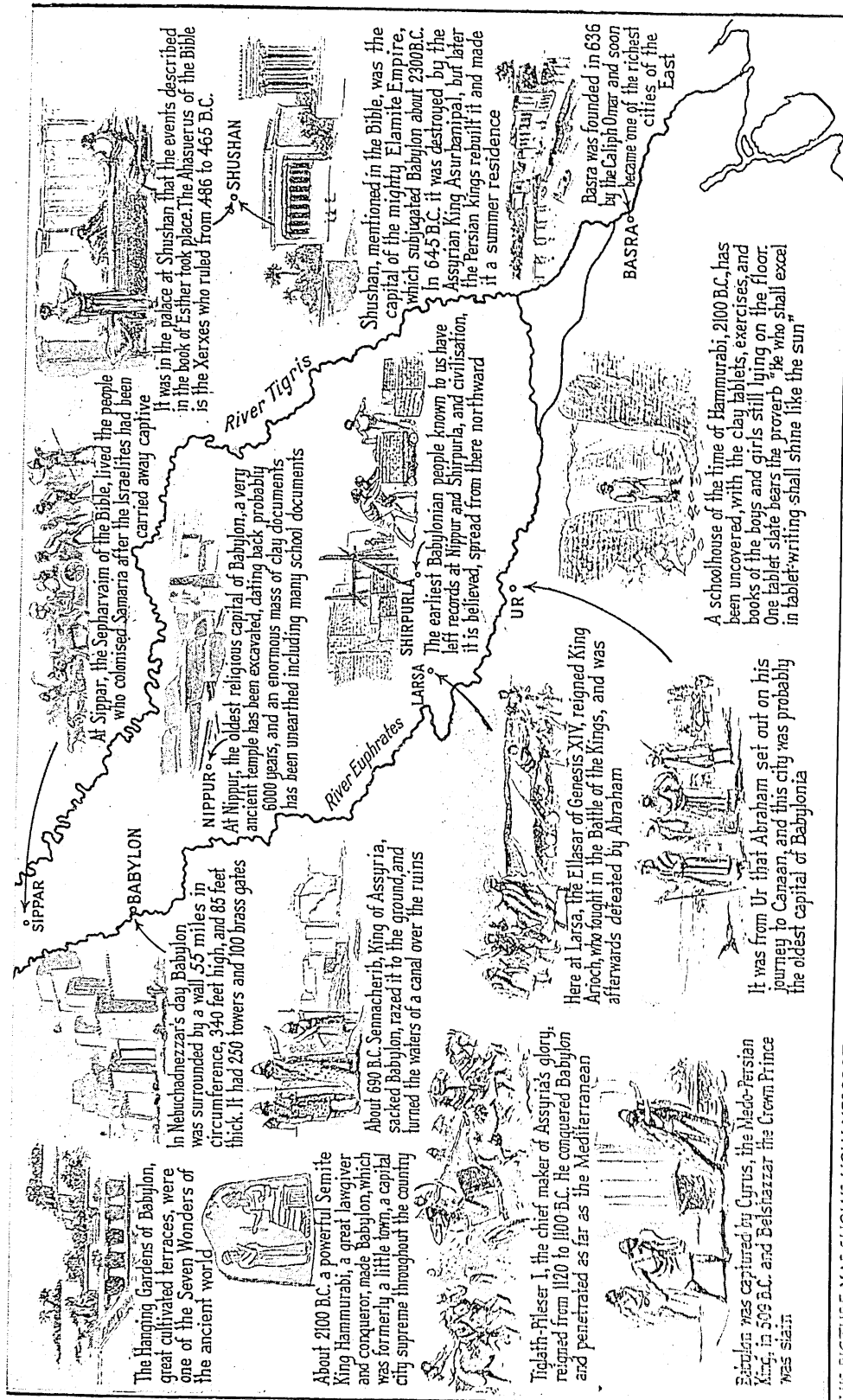


THE RIVER ORONTES AT ANTIOCH IN SYRIA

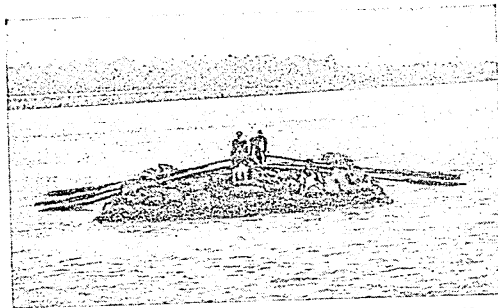
Many pictures of Palestine appear on pages 3463 to 3470. Further maps of Mesopotamia and maps of Arabia and Syria will be found in Section 52 of Group 12

EVENTS OF EIGHTY CENTURIES IN THE LAND BETWEEN THE RIVERS





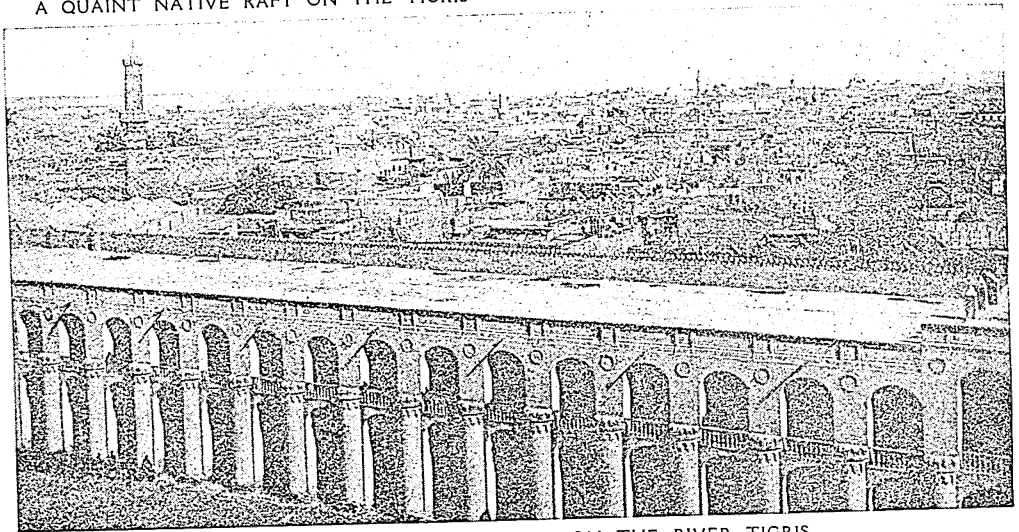
THIS PICTURE-MAP SHOWS HOW MESOPOTAMIA, THE LAND BETWEEN THE RIVERS, HAS BEEN THE SCENE OF A GREAT CIVILISATION AND A THRILLING HISTORY



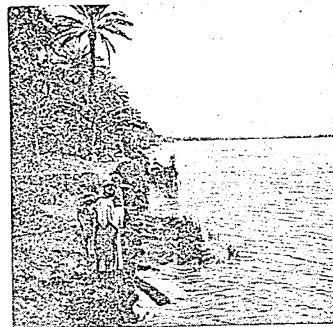
A QUAINT NATIVE RAFT ON THE TIGRIS



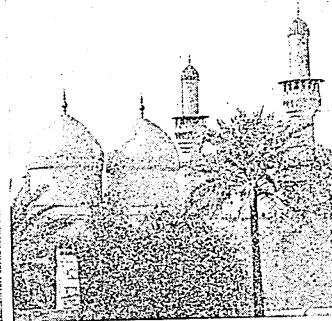
A QUIET SCENE NEAR BASRA



THE GREAT CITY OF BAGHDAD ON THE RIVER TIGRIS



ON THE BANKS OF THE SHAT-
EL-ARAB NEAR BASRA



THE MOSQUE AT KAZIMAIN
WITH ITS. GOLDEN DOMES



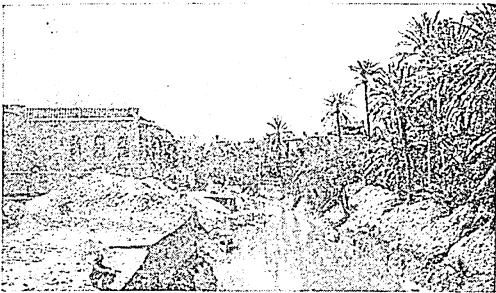
A STREET SCENE IN HILLAH
ON THE EUPHRATES



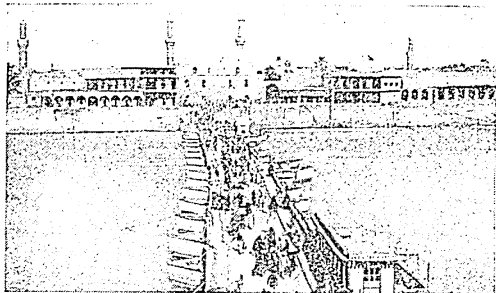
AN ARAB BOAT ON THE TIGRIS



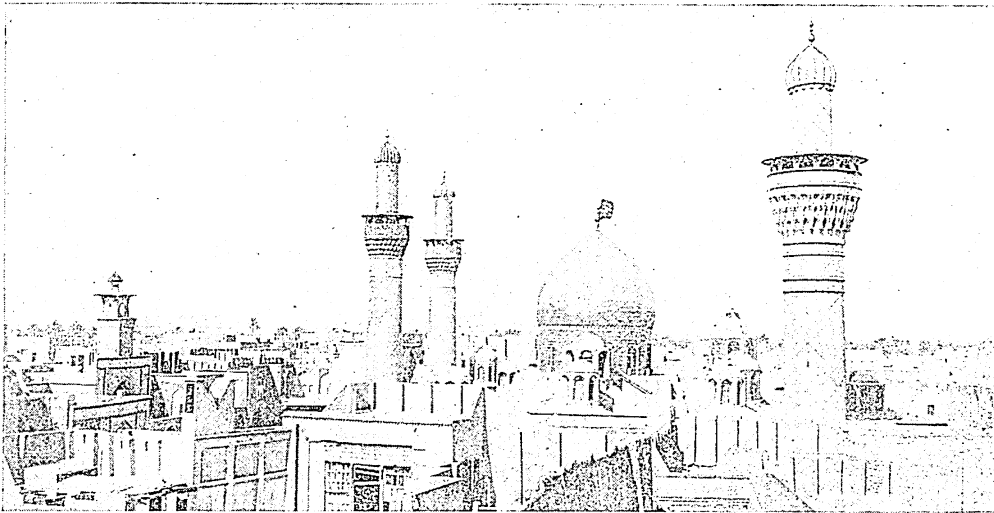
THE RIVER TIGRIS NEAR BAGHDAD



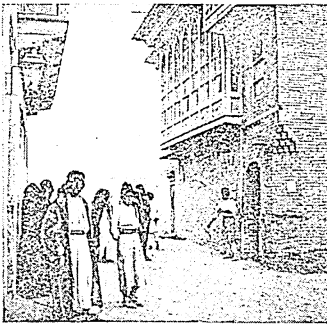
NATIVE BOATS ON A CREEK IN BASRA



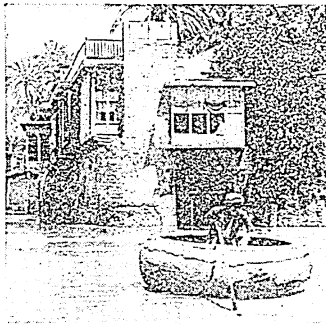
THE BRIDGE OF BOATS AT BAGHDAD



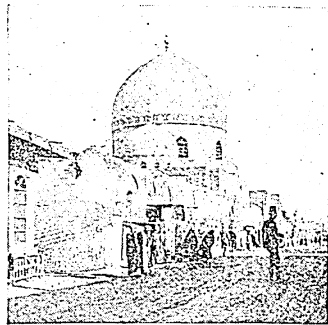
BAGHDAD. SHOWING SOME OF ITS MANY MINARETS



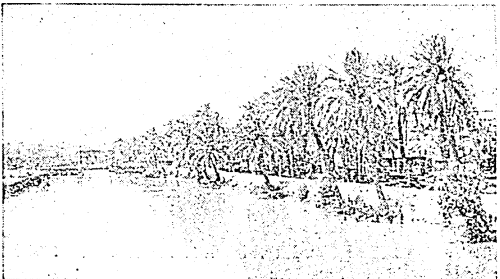
A STREET IN KUT-EL-AMARA



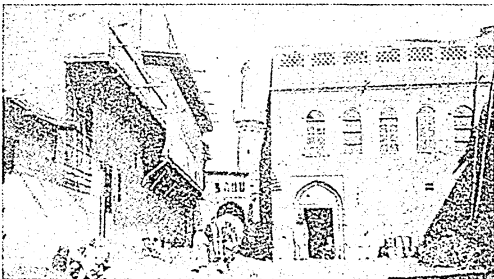
NATIVE HOUSES AT BAGHDAD



THE GREAT MOSQUE AT BAGHDAD

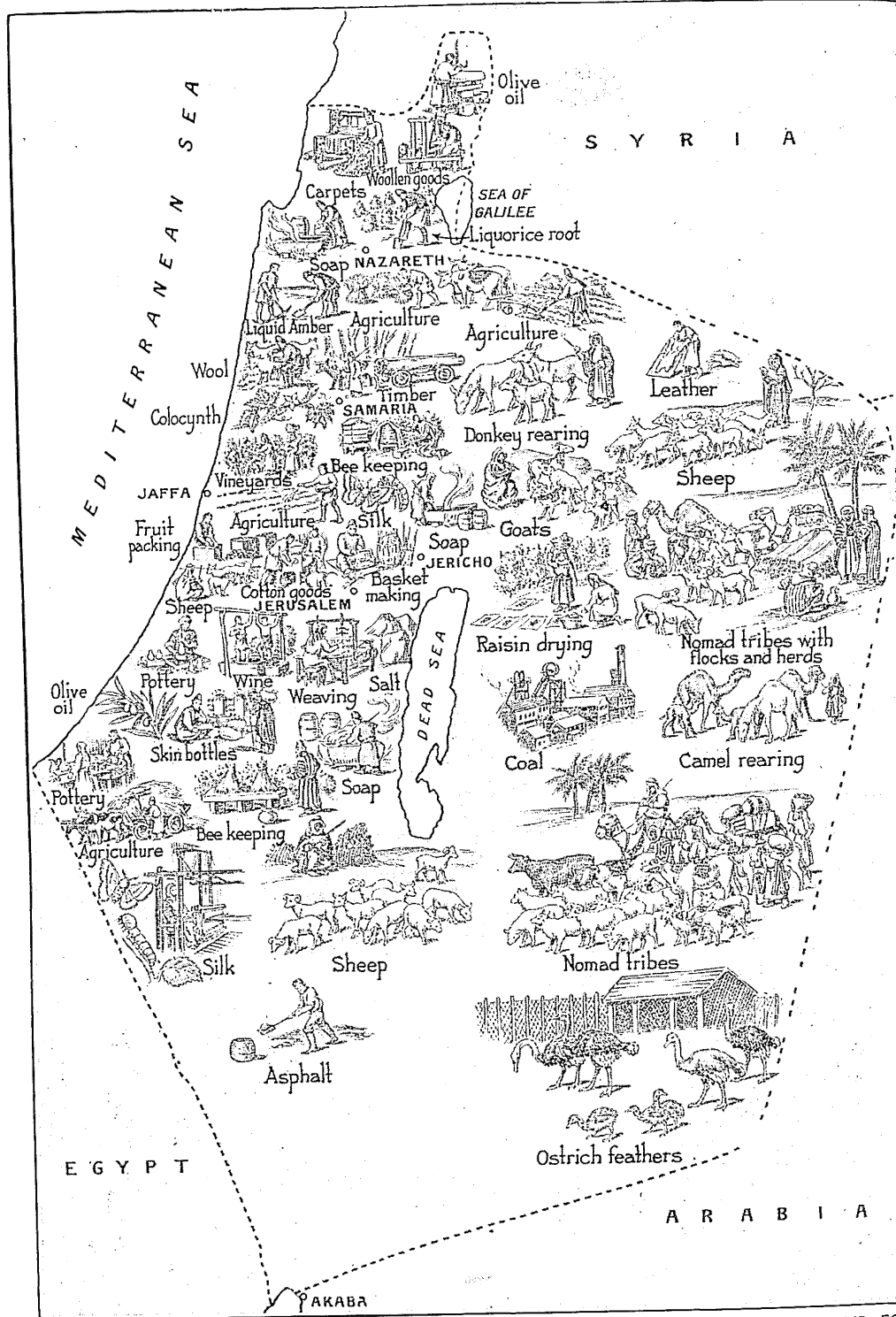


ASHAR CREEK. LEADING TO BASRA



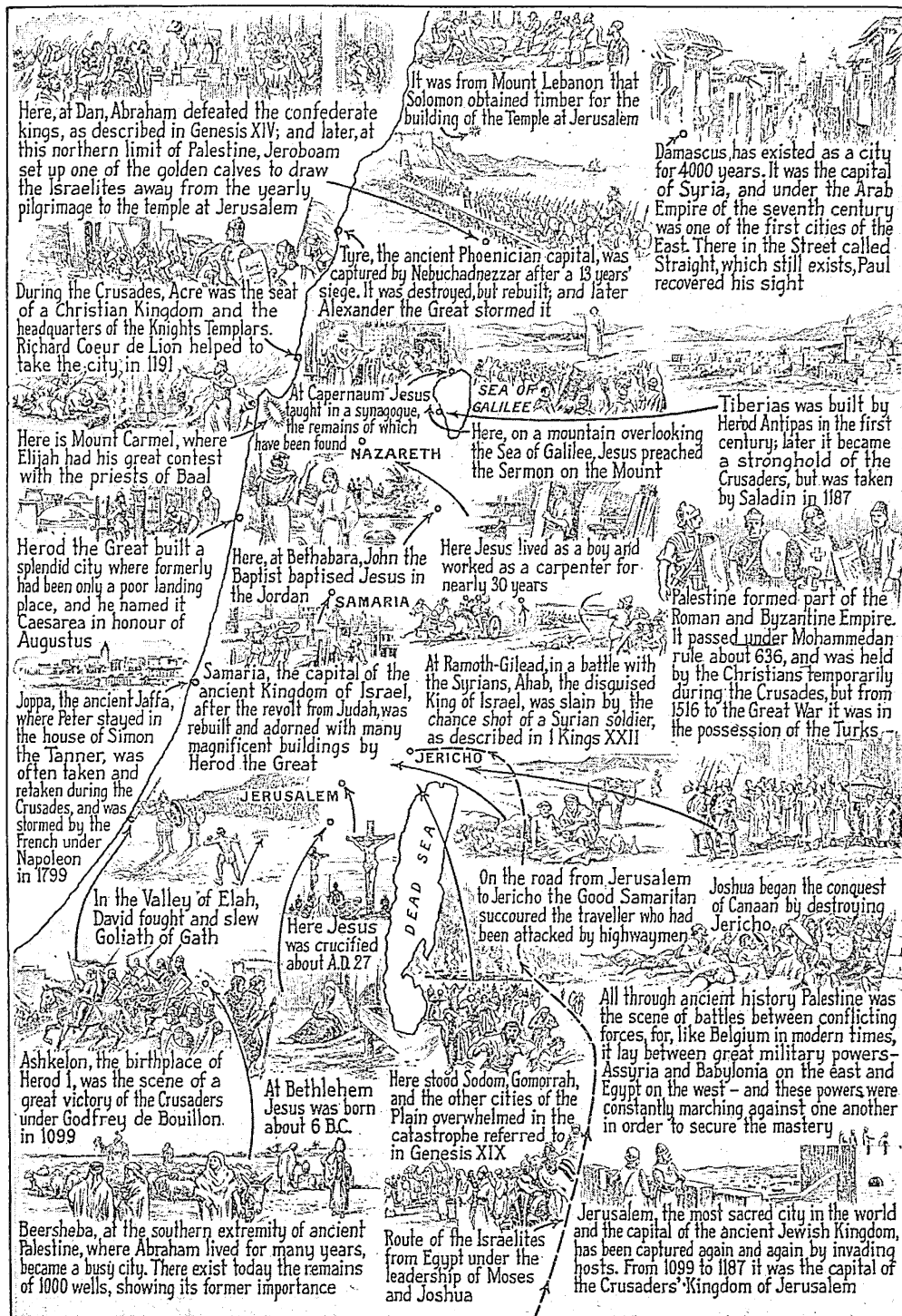
THE MOSQUE AT KUT-EL-AMARA

THE GROWING INDUSTRIES OF PALESTINE

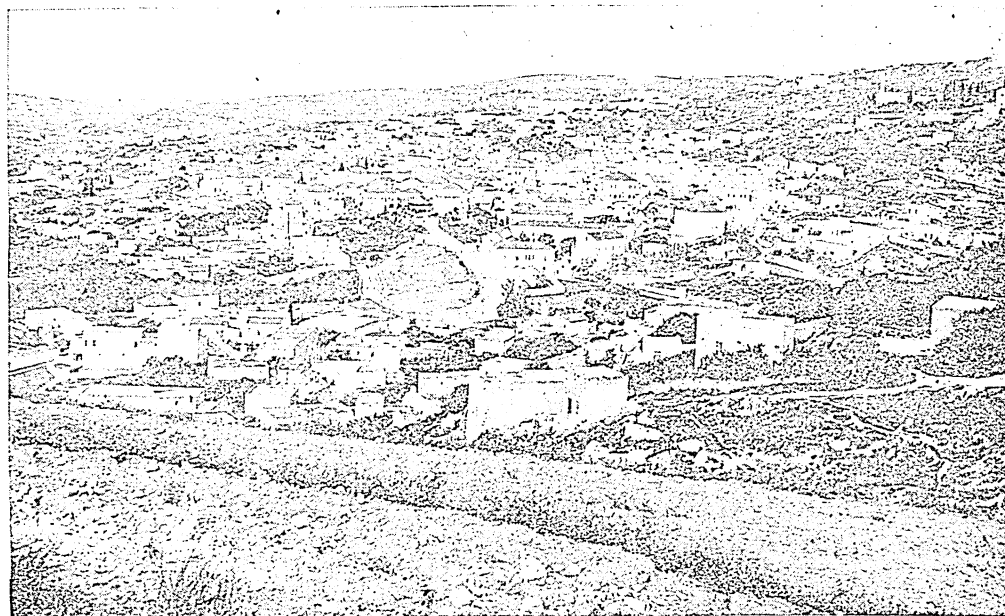


PALESTINE'S INDUSTRIES, SHOWN HERE, ARE RAPIDLY INCREASING IN IMPORTANCE, AND FORM A CURIOUS BLEND OF THE OLD AND THE NEW

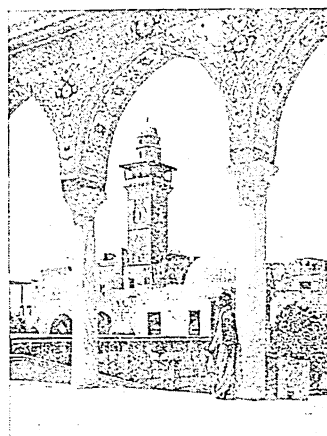
THE STIRRING PAST OF PALESTINE



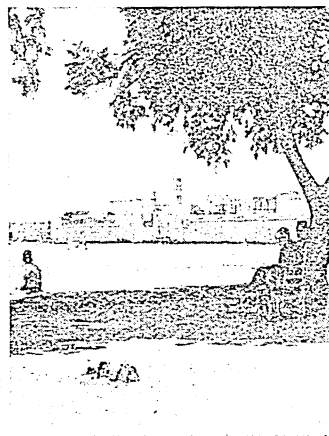
PALESTINE HAS BEEN THE SCENE OF MANY THRILLING INCIDENTS, AND HERE WE SEE SOME OF THE CHIEF EVENTS IN HER HISTORY



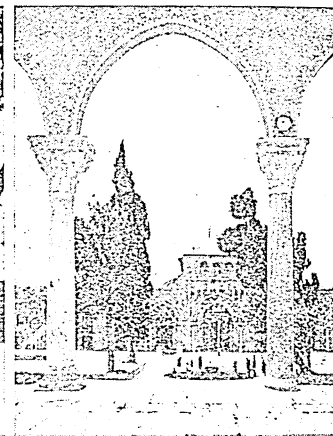
LOOKING DOWN ON THE TOWN OF NAZARETH IN GALILEE



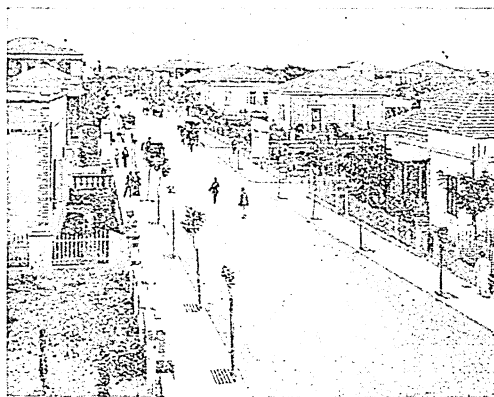
ON THE TERRACE OF THE
MOSQUE OF OMAR, JERUSALEM



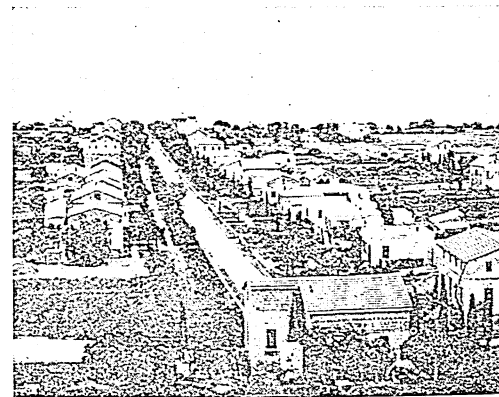
THE SEAPORT
OF ACRE



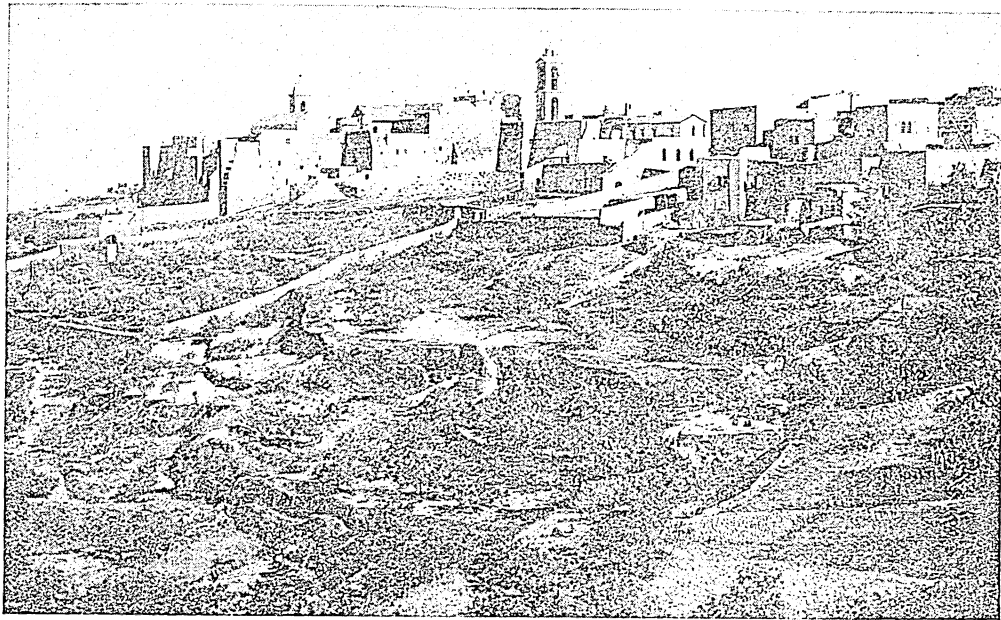
THE MOSQUE OF AKSA AND THE
WELL OF EL KAS AT JERUSALEM



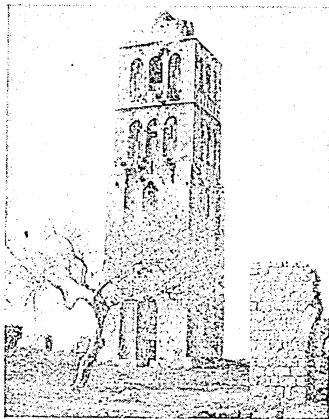
THE MAIN STREET OF THE MODERN JEWISH
QUARTER OF JAFFA



THE TOWN OF HAIFA, NEAR THE FOOT
OF MOUNT CARMEL



BETHLEHEM, THE BIRTHPLACE OF JESUS



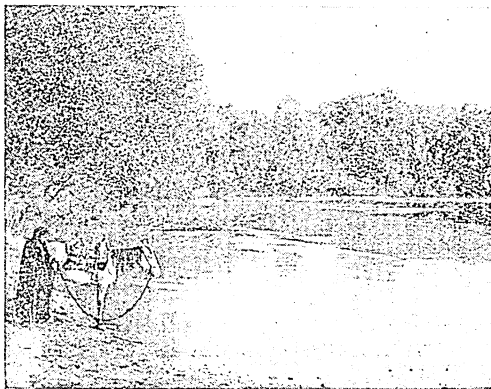
THE TOWER OF THE FORTY
MARTYRS AT RAMLEH



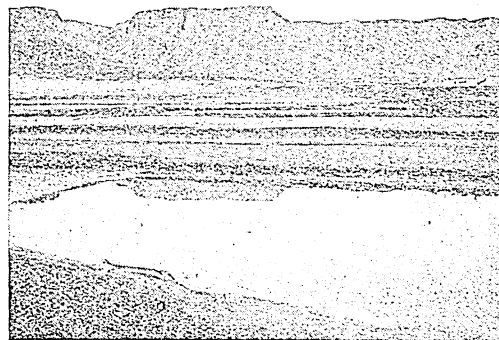
A STREET SCENE
IN TIBERIAS



PASSING THROUGH THE
WADY HEBRAN

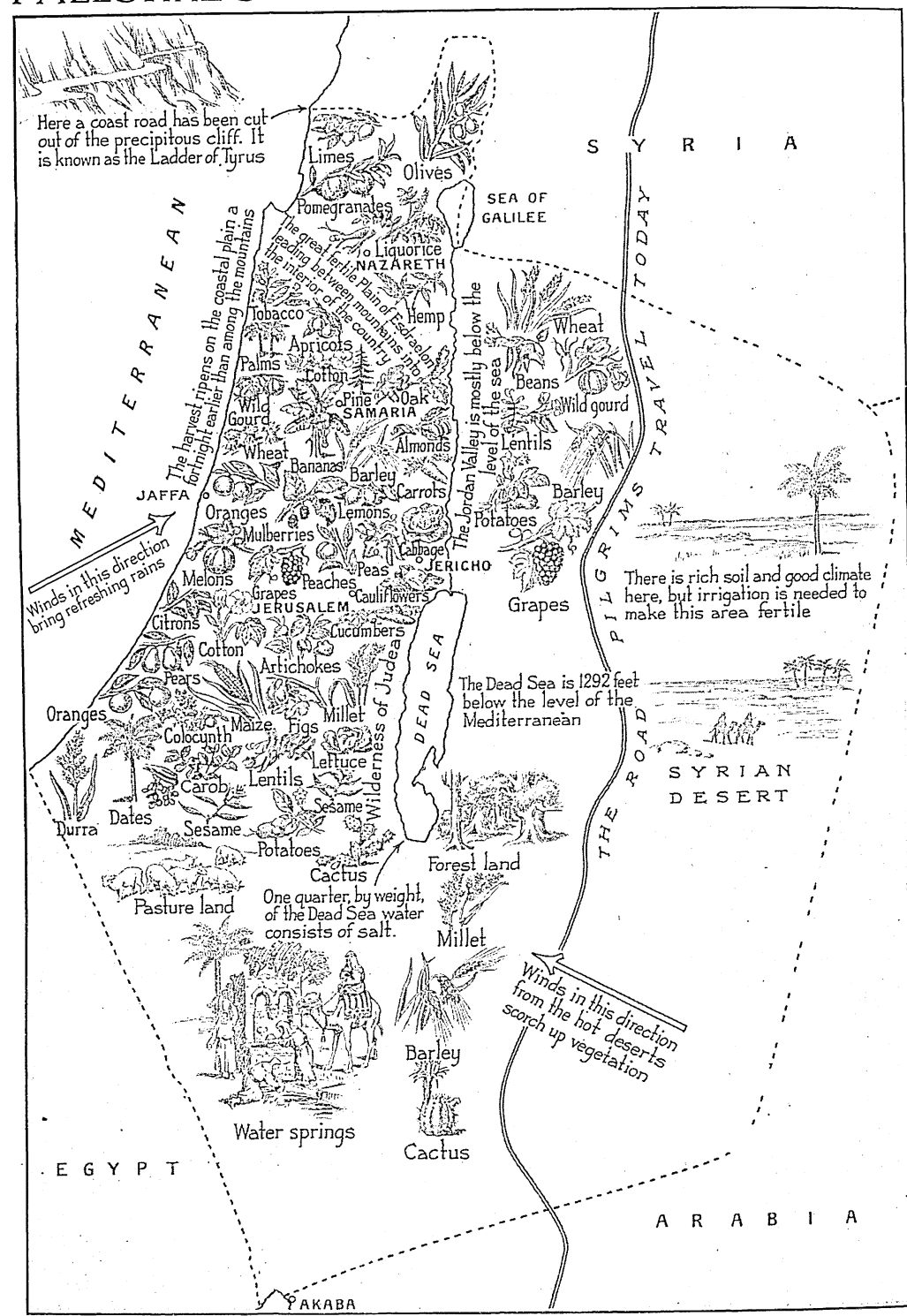


A BEDOUIN HORSEMAN ON THE BANK OF
THE JORDAN



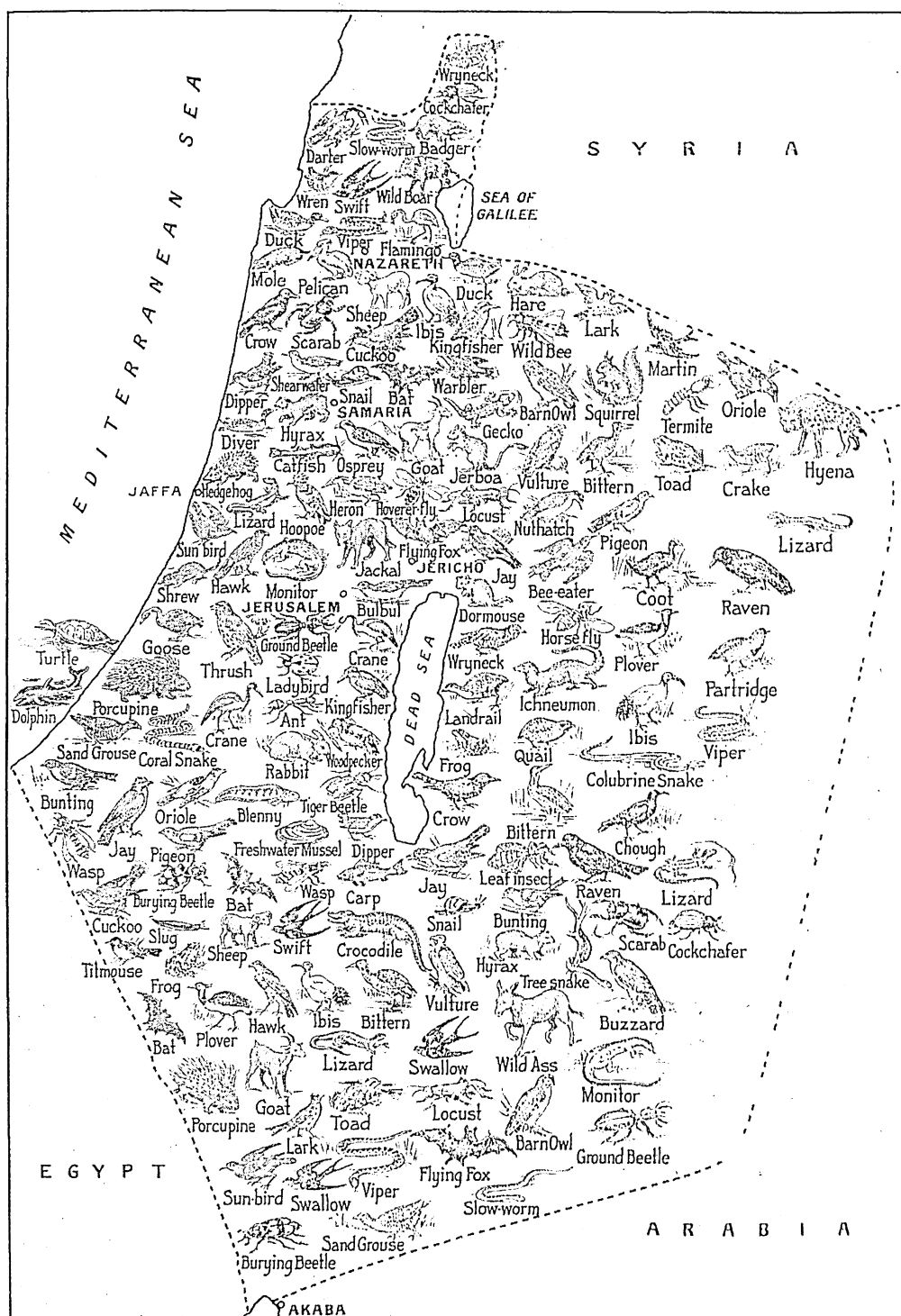
THE ANCIENT FORTRESS OF MASADA, ON
THE DEAD SEA

PALESTINE'S PLANTS & NATURAL FEATURES



THOUGH LESS FERTILE THAN IN BIBLE DAYS, PALESTINE STILL PRODUCES GOOD CROPS OF MANY USEFUL PLANTS

THE VARIED ANIMAL LIFE OF PALESTINE



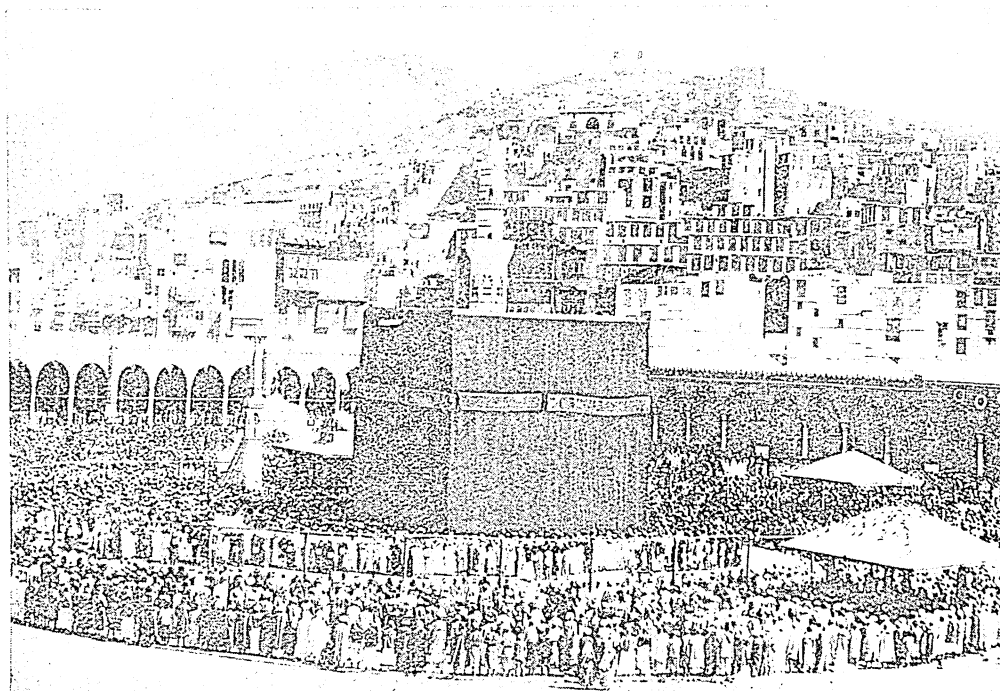
THOUGH IT HAS LOST THE FIERCER ANIMALS OF BIBLE TIMES, PALESTINE STILL POSSESSES A VERY VARIED WILD LIFE



ENTRANCE TO THE HARBOUR AT MUSCAT



THE TOWN OF ES SALT IN TRANSJORDANIA



MOHAMMEDAN PILGRIMS PRAYING ROUND THE KAABA, THE SACRED SHRINE AT MECCA



THE HILL OF THE ACROPOLIS AT PETRA



THE ROOFS AND MINARETS OF MEDINA

The pictures on these pages belong to The American Colony, Jerusalem: the E.N.A.; Donald McLeish and others

One Thousand Poems of All Times and All Countries

POETS without number have addressed odes to the skylark and tried to describe the joyous song the bird pours forth as it wings skyward, but not many have succeeded. One of the finest descriptions of the skylark and its song is this famous ode by Percy Bysshe Shelley. There is scarcely a line in these twenty-one verses that is not perfect in the beautiful image it raises in our mind's eye or the thought it suggests to us, and the whole poem is a glorious achievement of art. That is, perhaps, its fault, as in reading it we are not so much conscious of the skylark itself as we are of the poet telling us about the little singer of the skies. It is, none the less, one of the shorter masterpieces of English poetry, and contains many phrases of such perfect form that they will remain for ever in our memory.

TO A SKYLARK

HAIL to thee, blithe spirit!
Bird thou never wert,
That from heaven or near it
Pourest thy full heart
In profuse strains of unpremeditated art.

HIGHER still, and higher,
From the earth thou springest,
Like a cloud of fire;
The blue deep thou wingest,
And singing still dost soar, and soaring
ever singest.

IN the golden lightning
Of the sunken sun,
O'er which clouds are bright'ning,
Thou dost float and run,
Like an unbodied joy whose race is just
begun.

THE pale purple even
Melts around thy flight;
Like a star of Heaven,
In the broad daylight
Thou art unseen, but yet I hear thy shrill
delight.

KEEN as are the arrows
Of that silver sphere,
Whose intense lamp narrows
In the white dawn clear,
Until we hardly see, we feel that it is there.

ALL the earth and air
With thy voice is loud,
As, when night is bare,
From one lonely cloud
The moon rains out her beams, and heaven
is overflowed.

WHAT thou art we know not;
What is most like thee?
From rainbow clouds there flow not
Drops so bright to see;
As from thy presence showers a rain of
melody:

LIKE a poet hidden
In the light of thought,
Singing hymns unbidden,
Till the world is wrought
To sympathy with hopes and fears it
heeded not:

LIKE a high-born maiden
In a palace tower,
Soothing her love-laden
Soul in secret hour
With music sweet as love, which overflows
her bower:

LIKE a glow-worm golden,
In a dell of dew,
Scattering unbeholden
Its ærial hue
Among the flowers and grass which screen
it from the view:

LIKE a rose embowered
In its own green leaves,
By warm winds deflowered,
Till the scent it gives
Makes faint with too much sweet those
heavy-winged thieves:

SOUND of vernal showers
On the twinkling grass,
Rain-awakened flowers,
All that ever was
Joyous and clear and fresh, thy music
doth surpass.

TEACH us, sprite or bird,
What sweet thoughts are thine:
I have never heard
Praise of love or wine
That panted forth a flood of rapture so
divine.

CHORUS hymeneal,
Or triumphal chant,
Matched with thine would be all

POEMS · SONGS · BALLADS · VERSES AND RHYMES WITH MUSIC

POETRY

ANNABEL LEE

But an empty vaunt,
A thing wherein we feel there is some
hidden want.

What objects are the fountains
Of thy happy strain?
What fields, or waves, or mountains?
What shapes of sky or plain?
What love of thine own kind? What
ignorance of pain?

With thy clear, keen joyance
Languor cannot be:
Shadow of annoyance
Never came near thee:
Thou lovest, but ne'er knew love's sad
satiety.

Waking or asleep,
Thou of death must deem
Things more true and deep
Than we mortals dream,
Or how could thy notes flow in such a
crystal stream?

We look before and after,
And pine for what is not:
Our sincerest laughter
With some pain is fraught;
Our sweetest songs are those that tell of
saddest thought.

Yet if we could scorn
Hate and pride and fear,
If we were things born
Not to shed a tear,
I know not how thy joy we ever should
come near.

Better than all measures
Of delightful sound,
Better than all treasures
That in books are found,
Thy skill to poet were, thou scorner of the
ground!

Teach me half the gladness
That thy brain must know,
Such harmonious madness
From my lips would flow,
The world should listen then, as I am
listening now.

HERE A LITTLE CHILD I STAND

Here is a quaint grace before meat for a little child, written
by Robert Herrick. Paddocks are toads. A benison is a
blessing. Though it is odd, it is surely a very pretty grace

HERE a little child I stand,
Heaving up my either hand;
Cold as paddocks though they be,
Here I lift them up to Thee,
For a benison to fall
On our meat and on us all. Amen.

This fanciful, sentimental poem by Edgar Allan Poe is an
example of his power of writing musical verse that sings
itself in tune with the momentary mood of his mind as he
writes. Annabel Lee was a creature in the world of fancy
in which Poe lived. His real world was sometimes gross.

It was many and many a year ago,
In a kingdom by the sea,
That a maiden there lived whom you may
know

By the name of Annabel Lee;
And this maiden she lived with no other
thought

Than to love and be loved by me.
I was a child and she was a child
In this kingdom by the sea:
But we loved with a love that was more
than love—

I and my Annabel Lee,
With a love that the wingèd seraphs of
heaven
Coveted her and me.

And this was the reason that, long ago,
In this kingdom by the sea,
A wind blew out of a cloud, chilling
My beautiful Annabel Lee,
So that her high-born kinsman came
And bore her away from me,
To shut her up in a sepulchre
In this kingdom by the sea.

The angels, not half so happy in heaven,
Went envying her and me—
Yes! that was the reason (as all men
know,

In this kingdom by the sea)
That the wind came out of the cloud by
night,
Chilling and killing my Annabel Lee.

But our love it was stronger by far than
the love

Of those who were older than we,
Of many far wiser than we,
And neither the angels in heaven above,
Nor the demons down under the sea,
Can ever dissever my soul from the soul
Of the beautiful Annabel Lee:

For the moon never beams without bring-
ing me dreams

Of the beautiful Annabel Lee;
And the stars never rise but I feel the
bright eyes

Of the beautiful Annabel Lee;
And so, all the night-tide, I lie down by
the side

Of my darling—my darling—my life and
my bride,

In the sepulchre there by the sea,
In her tomb by the sounding sea.

POETRY

PRAYERS

This consecration in prayer to the highest service of which the human spirit is capable is from the pen of Canon H. C. Beeching. The joy of youth, the strength of manhood, and the wisdom of faith of later years are offered back to God.

GOD who created me
Nimble and light of limb,
In three elements free,
To run, to ride, to swim:
Not when the sense is dim,
But now from the heart of joy,
I would remember Him:
Take the thanks of a boy.

Jesu, King and Lord,
Whose are my foes to fight,
Gird me with Thy sword,
Swift and sharp and bright.
Thee would I serve if I might;
And conquer if I can,
From day-dawn till night,
Take the strength of a man.

Spirit of Love and Truth,
Breathing in grosser clay,
The light and flame of youth,
Delight of men in the fray,
Wisdom in strength's decay;
From pain, strife, wrong to be free,
This best gift I pray,
Take my spirit to Thee.

THE WISH

No subject was seemingly dearer to the hearts of the earlier poets than contentment amid country surroundings without riches. Here is one of the best poems of that kind, written by Abraham Cowley, the Civil War and Restoration poet. But, earnest as these wishes seem, we know that Cowley was far from being contented when he secured the rural life he desired. Then he wished to get back to his native London. Cowley was more popular when he was alive than he has been since, though he was a thoughtful writer.

WELL, then! I now do plainly see
This busy world and I shall ne'er
agree.

The very honey of all earthly joy
Does of all meats the soonest cloy;
And they, methinks, deserve my pity
Who for it can endure the stings,
The crowd and buzz and murmurings,
Of this great hive, the city.

Ah, yet, ere I descend to the grave,
May I a small house and large garden
have;
And a few friends, and many books, both
true,
Both wise, and both delightful too!
And since Love ne'er will from me
flee,

A Mistress moderately fair,
And good as guardian angels are,
Only beloved and loving me!

Oh, fountains! When in you shall I
Myself, eased of unpeaceful thoughts,
espy?

Oh, fields! Oh, woods! When, when
shall I be made
The happy tenant of your shade?
Here's the spring-head of Pleasure's
flood:

Here's wealthy Nature's treasury,
Where all the riches lie that she
Has coined and stamped for good.

Pride and ambition here
Only in far-fetched metaphors appear;
Here nought but winds can hurtful
murmurs scatter,
And nought but Echo flatter.

The gods, when they descended, hither
From heaven did always choose their
way;
And therefore we may boldly say
That 'tis the way, too, thither.

How happy here should I
And one dear She live, and embracing
die!

She who is all the world, and can exclude
In deserts solitude.

I should have then this only fear:
Lest men, when they my pleasures see,
Should hither throng to live like me,
And so make a city here.

I STOOD TIP-TOE UPON A LITTLE HILL

This description of an early morning scene on Hampstead Hill was one of the first poems published by John Keats. Evidently he wrote with his eye on Nature's picture. The early sobbing of the dawn is overdone, but the scarcely heard whisper of the leaves is caught with a truthfulness that foretells the poet's art when he had reached his best.

I STOOD tip-toe upon a little hill,
The air was cooling, and so very still
That the sweet buds, which, with a modest
pride,

Pull droopingly, in slanting curve aside,
Their scanty-leaved and finely-tapering
stems,

Had not yet lost those starry diadems
Caught from the early sobbing of the morn.
The clouds were pure and white as flocks
new-shorn,

And fresh from the clear brook; sweetly
they slept
On the blue fields of heaven, and then
there crept

A little noiseless noise among the leaves:
Born of the very sigh that silence heaves:
For not the faintest motion could be seen
Of all the shades that slanted o'er the
green.

FROST AT MIDNIGHT

It is a frosty evening in February 1798, and in a little cottage at Nether Stowey, in Somerset, Samuel Taylor Coleridge sits musing by the dying fire. His child sleeps by his father's side. The poet begins to describe the scene. A "stranger," a film of sooty black, flutters on the fire-grate bar and reminds him of his belief in boyhood that such a sight foretold the coming of someone. Then he turns from his own boyhood to the childhood of the baby by his side, and in a passage of exalted beauty pictures how this child shall be reared to see and love the beauty of the Earth. It is a passage that has a lasting place in English literature, for that child was Hartley Coleridge, a poet as truly as his father was, but, alas, with his father's weakness of character as well as some share of his genius. "My babe so beautiful" grew up a man to break the heart of all those who loved him.

THE frost performs its secret ministry,
Unhelped by any wind. The owl's cry
Came loud—and hark, again! loud as
before.

The inmates of my cottage, all at rest,
Have left me to that solitude which suits
Abstruser musings: save that at my side
My cradled infant slumbers peacefully.

'Tis calm indeed! so calm that it disturbs
And vexes meditation with its strange
And extreme silentness. Sea, hill, and
wood,
This populous village! sea, and hill, and
wood,
With all the numberless goings-on of life,
Inaudible as dreams! the thin blue flame
Lies on my low-burnt fire, and quivers not;
Only that film which fluttered on the grate
Still flutters there, the sole unquiet thing.
Methinks its motion in this hush of Nature
Gives it dim sympathies with me who live,
Making it a companionable form,
Whose puny flaps and freaks the idling
Spirit
By its own moods interprets, everywhere
Echo or mirror seeking of itself,
And makes a toy of thought.

But O! how oft,
How oft, at school, with most believing
mind,
Presageful, have I gazed upon the bars
To watch that fluttering stranger! and as
oft,
With unclosed lids, already had I dreamt
Of my sweet birthplace, and the old
church-tower,
Whose bells, the poor man's only music,
rang
From morn to evening, all the hot Fair-day,
So sweetly, that they stirred and haunted
me

With a wild pleasure, falling on mine ear
Most like articulate sounds of things to
come!

So gazed I, till the soothing things I dreamt
Lulled me to sleep, and sleep prolonged
my dreams!

And so I brooded all the following morn,
Awed by the stern preceptor's face, mine
eye

Fixed with mock study on my swimming
book:

Save if the door half opened, and I snatched
A hasty glance; and still my heart leaped
up,

For still I hoped to see the stranger's
face,
Townsmen, or aunt, or sister more beloved,
My playmate when we both were clothed
alike!

Dear babe, that sleepest cradled by my
side,
Whose gentle breathings, heard in this
deep calm,

Fill up the interspersed vacancies
And momentary pauses of the thought!
My babe so beautiful! it thrills my heart
With tender gladness thus to look at thee,
And think that thou shalt learn far other
lore

And in far other scenes! For I was reared
In the great city, pent 'mid cloisters dim,
And saw naught lovely but the sky and
stars.

But thou, my babe, shalt wander like a
breeze

By lakes and sandy shores, beneath the
crag

Of ancient mountains, and beneath the
clouds,

Which image in their bulk both lakes and
shores

And mountain crags. So shalt thou see and
hear

The lovely shapes and sounds intelligible
Of that eternal language which thy God
Utters, Who from eternity doth teach
Himself in all, and all things in Himself.
Great universal Teacher! He shall mould
Thy spirit, and by giving make it ask.

Therefore all seasons shall be sweet to
thee:

Whether the summer clothe the general
earth

With greenness, or the redbreast sit and
sing

Betwixt the tufts of snow on the bare
branch

POETRY

Of mossy apple tree, while the night thatch
Smokes in the sun-thaw ; whether the eve-
drops fall,
Heard only in the trances of the blast,
Or if the secret ministry of frost
Shall hang them up in silent icicles,
Quietly shining to the quiet moon.

A FATHER'S BLESSING

This quaint will of good wishes was made by Richard Corbet, who was somewhat of a poet in the same period as Shakespeare. From being a poor boy he became a bishop, first of Oxford and then of Norwich. An observant reading of the good things that the bishop wished for his children throws a good deal of light on the spirit of his age.

WHAT I shall leave thee none can tell,
But all shall say I wish thee well ;
I wish thee, Vin, before all wealth,
Both bodily and ghostly health :
Nor too much wealth nor wit come to
thee,
So much of either may undo thee.
I wish thee learning not for show,
Enough for to instruct and know ;
Not such as gentlemen require
To prate at table or at fire.
I wish thee all thy mother's graces,
Thy father's fortunes and his places.
I wish thee friends, and one at Court,
Not to build on, but support ;
To keep thee not in doing many
Oppressions, but from suffering any.
I wish thee peace in all thy ways,
Nor lazy nor contentious days ;
And, when thy soul and body part,
As innocent as now thou art.

IF

Here Mr. Kipling speaks in one of the finest things he ever wrote. A distinguished British general was talking about the Great War. He went through all its dark hours, and there were days when it seemed to him that life could never be worth living again. At such times as that this general took out of his pocket a crumpled-up copy of "If," and read it through. He read it again and again, and life became a new thing. He sent home for hundreds of copies of it, and whenever he came across a soldier in despair he took "If" from his pocket and gave it to him. These are the words of it, taken from Mr. Kipling's book *Rewards and Fairies*.

IF you can keep your head when all
about you
Are losing theirs and blaming it on you ;
If you can trust yourself when all men
doubt you,
But make allowance for their doubting
too ;
If you can wait and not be tired by waiting,
Or being lied about, don't deal in lies,
Or being hated don't give way to hating,
And yet don't look too good, nor talk
too wise ;

If you can dream—and not make dreams
your master ;
If you can think—and not make
thoughts your aim ;
If you can meet with Triumph and
Disaster
And treat those two impostors just the
same ;
If you can bear to hear the truth you've
spoken
Twisted by knaves to make a trap for
fools,
Or watch the things you gave your life to
broken,
And stoop and build 'em up with worn-
out tools ;
If you can make one heap of all your
winnings
And risk it in one turn of pitch-and-
toss,
And lose, and start again at your begin-
nings,
And never breathe a word about your
loss ;
If you can force your heart and nerve and
sinew
To serve your turn long after they are
gone,
And so hold on when there is nothing in
you
Except the Will which says to them :
" Hold on ! "
If you can talk with crowds and keep your
virtue,
Or walk with Kings—nor lose the com-
mon touch ;
If neither foes nor loving friends can hurt
you ;
If all men count with you, but none too
much ;
If you can fill the unforgiving minute
With sixty seconds' worth of distance
run ;
Yours is the Earth and everything that's
in it,
And—which is more—you'll be a Man,
my son !

SO LIVE

This happily-turned epigram, flanking up a whole lifetime, is by Sir William Jones, who lived from 1746 to 1794.

ON parent knees, a naked new-born
child,
Weeping thou sat'st, while all around thee
smiled :
So live that, sinking to thy life's last
sleep,
Calm thou may'st smile, while all around
thee weep.

POETRY

A PARABLE

James Russell Lowell, the American poet, conveys a very beautiful lesson in this poetic parable. We often hear it said that no miracles now take place, yet the bursting into flower of a little mountain violet is as great a miracle as we require to believe in the everlasting Power that guides and sustains this world of ours. Eld in the seventh vers means olden time, and comes from the Anglo-Saxon.

WORN and footsore was the Prophet
When he gained the holy hill;
"God has left the earth," he murmured;
"Here His presence lingers still.

"God of all the olden prophets,
Wilt Thou speak with men no more?
Have I not as truly served Thee
As Thy chosen ones of yore?

"Hear me, Guider of my fathers.
Lo, a humble heart is mine;
By Thy mercy, I beseech Thee,
Grant Thy servant but a sign!"

Bowing then his head, he listened
For an answer to his prayer;
No loud burst of thunder followed,
Not a murmur stirred the air;

But the tuft of moss before him
Opened while he waited yet,
And from out the rock's hard bosom
Sprang a tender violet.

"God, I thank Thee," said the Prophet.
"Hard of heart and blind was I,
Looking to the holy mountain
For the gift of prophecy.

"Still Thou speakest with Thy children
Freely as in eld sublime;
Humbleness and love and patience
Still give empire over time.

"Had I trusted in my nature,
And had faith in lowly things,
Thou Thyself wouldst then have sought
me,
And set free my spirit's wings.

"But I looked for signs and wonders
That o'er men should give me sway;
Thirsting to be more than mortal,
I was even less than clay.

"Ere I entered on my journey,
As I girt my loins to start,
Ran to me my little daughter,
The beloved of my heart;

"In her hand she held a flower,
Like to this as like may be,
Which beside my very threshold
She had plucked and brought to me."

OUT OF THE NIGHT

William Ernest Henley, the writer of this powerful poem, was a great sufferer—a strong man crippled. Some of his most striking poems were written in Edinburgh hospital. But he never gave in. He believed intensely in the power of a man's will. Each man, he held, should preserve his own individuality. This poem is an expression of that belief.

OUT of the night that covers me,
Black as the pit from pole to pole,
I thank whatever gods may be
For my unconquerable soul.

In the fell clutch of circumstance
I have not winced nor cried aloud;
Under the bludgeonings of chance
My head is bloody, but unbowed.

Beyond this place of wrath and tears
Looms but the horror of the shade,
And yet the menace of the years
Finds and shall find me unafraid.

It matters not how strait the gate,
How charged with punishments the
scroll,
I am the master of my fate,
I am the captain of my soul.

APOLOGIA

Dying is a crisis which few poets face fairly. Not so Edmund Gosse. He is candid and sincere in his view of himself and what he fears and hopes for at the last. And who will say his hopes are not well founded if sufficient breadth be given to his interpretation of the word Love?

I HAVE not sinned against the God of
Love,
And so I think that when I come to die
His face will reach to me, and hang above,
And comfort me, and hush me where
I lie.

Weak am I, full of faults, and on the
brink
Of Death perchance with awe my pulse
shall move;

I am not fit to die, and yet I think
I have not sinned against the God of
Love.

I have desired fame, riches, the clear
crown
Of influence, and pleasure's long-drawn
zest,

Yet at all times I would have laid these
down
To please the human heart that I love
best.

Wherefore I hope, when I must go my way
Down that dark, doubtful road that
mortals prove,

Some one will cheer my shivering soul,
and say:
He has not sinned against the God of
Love.

POETRY

PEGGY

The "wawking of the fauld" means the watching of the fold, and this tender love-song for youth and maid takes us into the quiet of the evening. Allan Ramsay, the writer, who was born in 1686, was one of the masters of the Scottish vernacular. "A' the lave" means all the rest.

My Peggy is a young thing,
Just entered in her teens,
Fair as the day, and sweet as May,
Fair as the day, and always gay;
My Peggy is a young thing,
And I'm not very auld,
Yet well I like to meet her at
The wawking of the fauld.

My Peggy speaks sae sweetly
Whene'er we meet alane,
I wish nae mair to lay my care,
I wish nae mair of a' that's rare;
My Peggy speaks sae sweetly,
To a' the lave I'm cauld,
But she gars a' my spirits glow
At wawking of the fauld.

My Peggy smiles sae kindly
Whene'er I whisper love,
That I look down on a' the town,
That I look down upon a crown;
My Peggy smiles sae kindly,
It makes me blyth and bauld,
And naething gives me sic delight
As wawking of the fauld.

My Peggy sings sae softly
When on my pipe I play,
By a' the rest it is confest,
By a' the rest, that she sings best;
My Peggy sings sae softly,
And in her sangs are tauld
With innocence the wale of sense,
At wawking of the fauld.

THE GREEN FIELDS OF ENGLAND

Arthur Hugh Clough, the poet friend of Matthew Arnold, had to leave England in search of health, and in these verses he seeks to express his love and longing for her.

GREEN fields of England! wheresoe'er
Across this watery waste we fare,
One image at our hearts we bear,
Green fields of England, everywhere.

Sweet eyes in England, I must flee
Past where the waves' last confines be
Ere your loved smile I cease to see,
Sweet eyes in England, dear to me.

Dear home in England, safe and fast,
If but in thee my lot lie cast,
The past shall seem a nothing past
To thee, dear home, if won at last;
Dear home in England, won at last.

A PIPER

The naturalness of joy is one of the big things we are liable to forget, but poets are licensed to believe that a merry piper can bring it alive again. The poet who writes these lines is Seumas O'Sullivan, an Irishman, and the Irish are always fluctuating between sadness and mirth.

A PIPER in the streets today
Set up, and tuned, and started to
play,
And away, away, away on the tide
Of his music we started; on every side
Doors and windows were opened wide,
And men left down their work and came,
And women with petticoats coloured like
flame.
And little bare feet that were blue with
cold
Went dancing back to the age of gold,
And all the world went gay, went gay,
For half an hour in the street today.

YE LITTLE BIRDS THAT SIT AND SING

The poets of the early Stuart days were adepts in love poetry. Here is an example from that most prolific of dramatists Thomas Heywood, who in these lines commissions the birds to plead his cause with his lady-love.

YE little birds that sit and sing
Amidst the shady valleys,
And see how Phillis sweetly walks
Within her garden alleys:
Go, pretty birds, about her bower;
Sing, pretty birds, she may not lower:
Ah me! methinks I see her frown!
Ye pretty wantons, warble.

Go, tell her through your chirping bills,
As you by me are bidden,
To her is only known my love,
Which from the world is hidden.
Go, pretty birds, and tell her so;
See that your notes strain not too low,
For still methinks I see her frown;
Ye pretty wantons, warble.

Go tune your voices' harmony
And sing, I am her lover;
Strain loud and sweet, that every note
With sweet content may move her:
And she that hath the sweetest voice,
Tell her I will not change my choice;
Yet still methinks I see her frown!
Ye pretty wantons, warble.

O fly! make haste! see, see, she falls
Into a pretty slumber!
Sing round about her rosy bed
That, waking, she may wonder;
Say to her, 'tis her lover true
That sendeth love to you, to you!
And when you hear her kind reply,
Return with pleasant warblings.

LITTLE VERSES FOR VERY LITTLE PEOPLE

FOOT SOLDIERS

Tis all the way to Toe-town,
Beyond the Knee-high hill,
That Baby has to travel down
To see the soldiers drill.

One, two, three, four, five, a-row,
A captain and his men,
And on the other side, you know,
Are six, seven, eight, nine, ten.
John Bannister Tabb

BABY-LAND

WHICH is the way to Baby-land?
Any one can tell;
Up one flight,
To your right;
Please to ring the bell.

What can you see in Baby-land?
Little folks in white—
Downy heads,
Cradle-beds,
Faces pure and bright!

What do they do in Baby-land?
Dream and wake and play,
Laugh and crow,
Shout and grow;
Jolly times have they!

What do they say in Baby-land?
Why, the oddest things;
Might as well
Try to tell
What a birdie sings!

Who is the Queen of Baby-land?
Mother, kind and sweet;
And her love,
Born above,
Guides the little feet.

George Cooper

LITTLE FEET

Two little feet, so small that both may
nestle
In one caressing hand,
Two tender feet upon the untried border
Of life's mysterious land.

Dimpled and soft, and pink as peach tree
blossoms
In April's fragrant days,
How can they walk among the briery
tangles
Edging the world's rough ways?

These rose-white feet, along the doubtful
future,
Must bear a mother's load;

Alas! since woman has the heavier
burden,
And walks the harder road.

Love, for a while, will make the path
before them
All dainty, smooth, and fair,
Will cull away the brambles, letting only
The roses blossom there.

But when the mother's watchful eyes are
shrouded
Away from sight of men,
And these dear feet are left without her
guiding,
Who shall direct them then?

How will they be allured, betrayed, de-
luded,
Poor little untaught feet!
Into what dreary mazes will they wander,
What dangers will they meet?

Will they go stumbling blindly in the
darkness
Of Sorrow's tearful shades?
Or find the upland slopes of Peace and
Beauty,
Whose sunlight never fades?

Will they go toiling up Ambition's summit,
The common world above?
Or in some nameless vale, securely shel-
tered,
Walk side by side with Love?

Some feet there be which walk Life's
track unwounded,
Which find but pleasant ways:
Some hearts there be to which this life
is only
A round of happy days.

But these are few. Far more there are
who wander
Without a hope or friend,
Who find their journey full of pains and
losses,
And long to reach the end.

How shall it be with her, the tender
stranger,
Fair-faced and gentle-eyed,
Before whose unstained feet the world's
rude highway
Stretches so far and wide?

Ah! who may read the future? For our
darling

We crave all blessings sweet,
And pray that He who feeds the crying
ravens
Will guide the baby's feet.

Elizabeth Akers

Imperishable Thoughts of Men Enshrined in the Books of the World

Shakespeare's Histories and Fantasies

IN the early part of his career as a playwright Shakespeare founded ten of his plays on the characters and reigns of English kings. Other plays were based on early British traditions, and some had a setting in Roman history. Here we outline the stories of two of the English plays, King John and Henry the Fifth, because they contain some of his most robust patriotism. As an example, too, we give Julius Caesar, a play which tells of the conspiracy that led to Caesar's death. Two of the most charming plays were poetic fantasies, in which dainty spirits take a part. These are *A Midsummer Night's Dream* and *The Tempest*. The last, perhaps the loveliest of all the poet's works, was his final play. In Shakespeare's day poets often put a veiled or hidden meaning into their writing, and there is little doubt that Prospero, the kindly magician in *The Tempest*, shadowed forth Shakespeare's self, and that Prospero's farewell to wizardry, and the relinquishing of his magic wand, is his farewell to the stage. "Our revels now are ended," he says. It is very beautifully sad.

KING JOHN

THE rightful heir to the throne of England was Arthur, still a boy, son of John Plantagenet's dead brother Geoffrey, though John had usurped the throne. But Philip, King of France, urged on by Arthur's mother Constance, had declared himself a supporter of the claims of young Arthur. The two kings, John and Philip, met outside the town of Angiers, part of the French possessions of the English king, to decide the question.

Angiers, loyal to the English king, whoever he might be, refused to open its gates to either side until it was decided who was the rightful heir. The armies skirmished hotly with each other, both suffering heavy losses and neither gaining an advantage; and each king claiming the victory again summoned the town to open its gates to his troops.

Then the citizens, to make peace, suggested that if the son of the King of France, Lewis the dauphin, should marry King John's beautiful niece Blanche, their interests might be united and the war cease. Prompted by his mother, who noticed that the King of France was impressed by the proposal, John accepted it, and offered to give to Blanche, as her dowry, large estates in France now under his rule. The young people, who were attracted by each other, were quite willing to marry, and so the kings made peace, the town opened

its gates, and the marriage was celebrated there with great joy.

No one objected except Constance, the mother of Arthur, the rightful heir. She passionately denounced the treachery by which the French king, for his own advantage, had deserted the cause of her son. Also Philip Faulconbridge, a bold soldier, and son of Richard Coeur de Lion, whose thoughts were all for England, saw how mean and paltry these selfish arrangements were, for each of the kings was only seeking to gain an advantage for himself—the French more possessions, and John the assent of the French king to his peaceful retention of the English crown.

But the plotting of the king did not succeed. For John had deeply offended the Pope by refusing to appoint an Archbishop of Canterbury whom the Pope had chosen, and a cardinal arrived from the Pope denouncing and excommunicating John, and demanding that the French king, under a similar threat, should continue to oppose the claims of John.

Philip hesitated long between the desire to be faithful to his promises to John, and his fear of the Pope's spiritual power; and Constance, always thinking of the rights of her son Arthur of Brittany, pleaded wildly with Philip that he would submit to the Pope. The dauphin also, though it was his wedding-day, and his bride was

against him, urged his father to renew the war. The war began afresh, and the English gained some advantage, chiefly through the bravery of the daring soldier Philip Faulconbridge, and Arthur of Brittany was captured by them.

The next plot of King John, who always depended on scheming rather than bold, straightforward action, was to remove young Arthur out of his way. To do this he persuaded Hubert, who guarded the boy in his imprisonment; to put out his eyes and then murder him. But Hubert was not so cruel as his agreement to serve the king in this dreadful way would lead one to suppose; and when Arthur, a most gentle and affectionate lad, pleaded with him to save him from such torture he relented and said

Sleep doubtless and secure
That Hubert, for the wealth of all the world,
Will not offend thee.

So he saved Arthur's life, but set the story about that he was dead, and King John believed it was true.

The belief that Arthur was dead, and that John had caused his murder, shocked all men, English as well as French, and when the king found he had become dangerously unpopular he regretted the course he had taken, and turned savagely on Hubert, who then admitted that the boy was alive. But meantime Arthur, seeking to escape, had leaped down from

the castle wall, and lay dead at the foot of the battlements.

When his body was found there, nobody would at first believe it was an accident, and Hubert had difficulty in clearing himself of the charge of murder. The English were so disgusted with their king's scheming falseness that, even when the French invaded England, some of the English ranged themselves on their side. Though the cardinal who came from the Pope tried to persuade the French to stop the war they would not, for the dauphin, the French king's eldest son, hoped to be king of England. Though at first the French were successful, the English who had favoured them gradually deserted them, and rallied round the English heir to the throne, Prince Henry, so that when King John died, not without suspicion of being poisoned, they were all united, and the French hopes of conquest were ended.

The national feelings were expressed in these famous words by the brave knight Philip Faulconbridge, who had always been faithful to his country:

This England never did, nor never shall,
Lie at the foot of a proud conqueror,
But when it first did help to wound itself.
Now these her princes have come home again,
Come the three corners of the world in arms,
And we shall shock them. Nought shall make
us rue

If England to itself do rest but true.

HENRY THE FIFTH

HENRY THE FIFTH had been thoughtless and wild during the life of his father Henry the Fourth, but as soon as his father died, and he felt the responsibility of kingship, he changed his course of life, his tone of mind, and his companions.

Though he was ambitious, and thought that he had a right to claim the throne of France, he knew the terribleness of war so well that he cautioned his advisers they must not advocate war unless they were sure the cause was just.

That assurance he received from the Fathers of his country's Church before he felt that, with a good conscience, he could assert his claims by arms in France.

When the French court heard that he was likely to claim the French crown through his ancestor Edward the Third, the dauphin, in derision, sent him a "tun" of tennis balls, as things more suitable for

him to play with than the armaments of war. It was an insult that he at once undertook to resent, after he had sent to execution certain nobles who had taken French bribes and entered into treasonable arrangements with the enemy.

When Henry invaded France the French king, Charles the Sixth, did not treat his presence with the levity that had been shown by the dauphin. He reminded his court of the English kings and princes who had been conquerors, and added:

This is a stem
Of that victorious breed; and let us fear
The native mightiness and fate of him.

The Constable of France, too, had taken the measure of the English king much truly than the flighty-minded Dauphin, whom he corrected.

You are too much mistaken in this king.
Question your Grace the late ambassadors,

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With what great state he heard their embassy,
How well supplied with noble counsellors,
How modest in exception, and, withal,
How terrible in constant resolution.

Summoning Harfleur to surrender Henry found it indefensible, the dauphin not being ready to come to its aid, and he accepted the welcome of the town as an act of hospitality. Meantime, Katharine, daughter of the king of France, was taking lessons in English from her waiting maid.

As Henry's army was small, and suffering from sickness, the French king sent to ask what ransom he would be given if they were allowed a safe return to England. With this spirit animating the French, who vastly outnumbered the English, the rival armies met at Agincourt.

As for Henry, he moved about among his men, listening unrecognised to their talk that he might gauge their spirit, and he found them, as English soldiers usually are, grumbling but unafraid.

When the armies formed up in battle array the Earl of Westmoreland, seeing the English were out numbered five to one, exclaimed :

O ! that we now had here
But one ten thousand of those men in England
That do no work today.

The king's reply has resounded through the country's story for centuries.

What's he that wishes so ?
My cousin Westmoreland ? No, my fair cousin :
If we are marked to die, we are enough
To do our country loss ; and if to live,
The fewer men, the greater share of honour.
God's will ! I pray thee, wish not one man more.
By Jove ! I am not covetous for gold ;
Nor care I who doth feed upon my cost ;
It yearns me not if men my garments wear ;
Such outward things dwell not in my desires ;
But, if it be a sin to covet honour,
I am the most offending soul alive.
No, 'faith, my coz, wish not a man from England :
God's peace ! I would not lose so great an honour
As one man more, methinks, would share from me
For the best hope I have. O, do not wish one
more ;
Rather proclaim it, Westmoreland, through my
host,
That he who hath no stomach to this fight,
Let him depart ; his passport shall be made,
And crowns for convoy put into his purse.
We would not die in that man's company
That fears his fellowship to die with us.

This day is called the feast of Crispian :
He that outlives this day, and comes safe home,
Will stand a-tiptoe when this day is named,
And rouse him at the name of Crispian.
He that shall live this day, and see old age,
Will yearly on the vigil feast his neighbours,
And say tomorrow is Saint Crispian :
Then he will strip his sleeve, and show his scars,
And say, these wounds I had on Crispin's day.
Old men forget : yet all shall be forgot,
But he'll remember, with advantages,
What feats he did that day ! Then shall our
names,
Familiar in his mouth as household words,
Harry the King, Bedford and Exeter,
Warwick and Talbot, Salisbury and Gloster,
Be in their flowing cups freshly remembered.
This story shall the good man teach his son ;
And Crispin Crispian shall ne'er go by,
From this day to the ending of the world,
But we in it shall be remembered ;
We few, we happy few, we band of brothers :
For he today that sheds his blood with me
Shall be my brother ; be he ne'er so vile,
This day shall gentle his condition :
And gentlemen in England, now a-bed,
Shall think themselves accursed they were not
here,

And hold their manhood cheap while any speaks
That fought with us upon Saint Crispin's day.

Once more the French, in the fulness of their confidence, sent a messenger with proposals for ransom if the English were let off, and he was dismissed by the king with a warning of impending defeat :

I fear thou'lt once more come again for ransom.

The battle quickly showed which army would need to pay ransom for its prisoners, and the former messenger presently reappeared in humbler mood to admit defeat. Of him King Henry asks :

What is this castle called that stands hard by?
Messenger : They call it Agincourt.

Henry : Then call we this the field of Agincourt.
Fought on the day of Crispin Crispianus.

And so came a lasting name into England's splendid history.

Then the scene changes to the French Court, where, in a spirit of mutual friendliness, English and French courtiers are fraternising, and King Henry is making love to the Princess Katharine with her English-speaking waiting maid to act as interpreter when their mutual lack of language fails—an interview which has its sequel in her becoming the English queen.

JULIUS CAESAR

WHEN Julius Caesar, the most famous of all Roman generals, had reached the height of his power, so that the citizens had offered to make him their king, other leading Romans became jealous of his great position, and some were seriously afraid that he might seek to reign over them contrary to the constitution of the Republic. Accordingly a band of them agreed to act together, and, if need be, save their country from danger by assassinating him.

The man of rarest character among them was Caesar's friend Brutus. But most of the rest were ambitious self-seekers. However, they deceived Brutus as to their real intentions, for he was too honest to see the treachery of mean natures. Caesar knew them all well ; he was not deceived. But he was too brave to shield himself from danger, and one night, even when his wife warned him not to go out into the streets he went, after saying to her :

Cowards die many times before their deaths ;
The valiant never taste of death but once.
Of all the wonders that I yet have heard,
It seems to me most strange that men should fear ;
Seeing that death, a necessary end,
Will come when it will come.

But his end had come. He was met, as he walked to the Senate House, by a group of men, most of whom he regarded as his friends, who surrounded him to address requests to him, and then suddenly stabbed him. When Brutus struck him he said, in astonishment, " Even thou, Brutus ! " and fell dead at their feet.

His death in this terrible way made a great sensation in Rome, and the citizens gathered to hear why this deed had been done to the greatest of them all. The conspirators arranged that Brutus should be the orator who would defend their action. After he had spoken the crowd, fickle and easily impressed by his stately language, was ready to believe that Caesar was a dangerous man, liable to be a tyrant, and suppress their liberty.

But Caesar had a smooth-tongued friend, Mark Antony, and he asked leave to speak to the crowd. This request Brutus granted, against the advice of the more cunning conspirators. When Antony faced the multitude he began his speech in a tone of respect for the murderers, but as he went on and carried the feelings of the

crowd with him, he gradually changed the tone of his speech into bitter reproach and denunciation, till he so stirred up the passions of those who listened that they chased the murderers out of the city. Here is that rousing speech.

Friends, Romans, countrymen, lend me your ears ;

I come to bury Caesar, not to praise him.
The evil that men do lives after them ;
The good is oft interrèd with their bones ;
So let it be with Caesar. The noble Brutus
Hath told you Caesar was ambitious :
If it were so, it was a grievous fault ;
And grievously hath Caesar answered it.
Here, under leave of Brutus and the rest
(For Brutus is an honourable man ;
So are they all, all honourable men),
Come I to speak in Caesar's funeral.
He was my friend, faithful and just to me ;
But Brutus says he was ambitious,
And Brutus is an honourable man.
He hath brought many captives home to Rome,
Whose ransoms did the general coffers fill :
Did this in Caesar seem ambitious ?
When that the poor have cried Caesar hath wept ;

Ambition should be made of sterner stuff :
Yet Brutus says he was ambitious,
And Brutus is an honourable man.
You all did see that on the Lupercal
I thrice presented him with a kingly crown,
Which he did thrice refuse. Was this ambition?
Yet Brutus says he was ambitious ;
And, sure, he is an honourable man.
I speak not to disprove what Brutus spoke,
But here I am to speak what I do know.
You all did love him once, not without cause ;
What cause withholds you, then, to mourn for him ?

O judgment, thou art fled to brutish beasts,
And men have lost their reason ! Bear with me ;

My heart is in the coffin there with Caesar,
And I must pause till it come back to me.

But yesterday the word of Caesar might
Have stood against the world ; now lies he there,
And none so poor to do him reverence.
O masters, if I were disposed to stir
Your hearts and minds to mutiny and rage,
I should do Brutus wrong, and Cassius wrong,
Who, you all know, are honourable men :
I will not do them wrong ; I rather choose

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To wrong the dead, to wrong myself, and you,
That I will wrong such honourable men.
But here's a parchment with the seal of Caesar,
I found it in his closet, 'tis his will :
Let but the commons hear this testament
(Which, pardon me, I do not mean to read),
And they would go and kiss dead Caesar's
wounds,
And dip their napkins in his sacred blood ;
Yea, beg a hair of him for memory,
And, dying, mention it within their wills,
Bequeathing it, as a rich legacy,
Unto their issue.

If you have tears, prepare to shed them now.
You all do know this mantle : I remember
The first time ever Caesar put it on ;
'Twas on a summer's evening, in his tent,
That day he overcame the Nervii :
Look ! In this place ran Cassius' dagger
through :

See what a rent the envious Casca made :
Through this the well-belovèd Brutus stabbed ;
And, as he plucked his cursèd steel away,
Mark how the blood of Caesar followed it,
As rushing out of doors, to be resolved
If Brutus so unkindly knocked, or no ;
For Brutus, as you know, was Caesar's angel :
Judge, O you gods, how dearly Caesar loved
him !

This was the most unkindest cut of all :
For when the noble Caesar saw him stab,
Ingratitude, more strong than traitors' arms,
Quite vanquished him ; then burst his mighty
heart ;
And, in his mantle muffling up his face,
Even at the base of Pompey's statue,
Which all the while ran blood, great Caesar
fell.

O, what a fall was there, my countrymen !
Then I, and you, and all of us fell down,
Whilst bloody treason flourished over us.
O, now you weep ; and I perceive you feel
The dint of pity : these are gracious drops.
Kind souls, what ! weep you when you but
behold
Our Caesar's vesture wounded ? Look you
here,
Here is himself, marred, as you see, with traitors.

Good friends, sweet friends, let me not stir you
up
To such a sudden flood of mutiny.
They that have done this deed are honourable ;
What private griefs they have, alas, I know not,

That made them do it : they are wise and
honourable,

And will, no doubt, with reasons answer you.
I come not, friends, to steal away your hearts ;
I am no orator, as Brutus is :
But, as you know me all, a plain, blunt man
That love my friend ; and that they know full
well

That gave me public leave to speak of him.
For I have neither wit, nor words, nor worth,
Action, nor utterance, nor the power of speech,
To stir men's blood : I only speak right on ;
I tell you that which you yourselves do know ;
Show you sweet Caesar's wounds, poor, poor
dumb mouths,

And bid them speak for me. But were I Brutus,
And Brutus Antony, there were an Antony
Would ruffle up your spirits, and put a tongue
In every wound of Caesar that should move
The stones of Rome to rise and mutiny.

War now followed. The chief leaders
who defended the memory of Caesar were
Mark Antony and Octavius ; while the
leaders of the forces that rallied to the
help of the conspirators were Brutus and
Cassius. The conspirators were utterly
routed. It was such a defeat as the
Roman idea of honour would not allow a
man to survive, and Brutus fell by run-
ning on his own sword. But before doing
so he bade good-bye to his friends around
him, and said words which show how his
own nature was so noble that it could
not discern deceit in others.

Farewell to you ; and you ; and you Volumnius.
Farewell to thee too, Strato. Countrymen,
My heart doth joy that yet, in all my life,
I found no man but he was true to me.

It was this strain of greatness in Brutus
that led Antony and Octavius, when they
found his body, to treat the dead with
great honour and say :

Antony: This was the noblest Roman of them all ;
All the conspirators save only he
Did that they did in envy of great Caesar ;
He only, in a general honest thought
And common good to all, made one of them.
His life was gentle, and the elements
So mixed in him that Nature might stand up
And say to all the world, " This was a man ! "

Octavius : According to his virtue let us use him.
With all respect and rites of burial.
Within my tent his bones tonight shall lie,
Most like a soldier, ordered honourably.

Brutus is really the hero of the play.

A MIDSUMMER NIGHT'S DREAM

THERE was once a Duke of Athens named Theseus, who was betrothed to Hippolyta, Queen of the Amazons.

It happened that when they were talking of their coming marriage an elderly courtier named Egeus came to them with his daughter Hermia and her two rival lovers, asking for the help of the Duke. It was her father's wish that Hermia should wed Demetrius but she would have none but Lysander. On hearing this Theseus told her that, by the law of Athens, she must do as her father wished, else she could be put to death or condemned to remain unmarried all her life.

Hermia was fain to profess she preferred to remain unmarried. But when she had drawn apart with Lysander she agreed to meet the next day in a wood a mile distant, and escape from Athens altogether. They took another into their secret, however, and told their plans to Helena, a friend of Hermia. As Helena was in love with Demetrius, she thought that if she told him of Hermia's purpose he would follow the lovers, and poor Helena herself would go after them that she might have the happiness of being near Demetrius, although he was not fond of her.

Fairies play a large part. They are introduced in this charming song by one of them :

Over hill, over dale,
Through bush, through brier,
Over park, over pale,
Through flood, through fire,
I do wander everywhere,
Swifter than the moone's sphere ;
And I serve the fairy queen,
To dew her orbs upon the green ;
The cowslips tall her pensioners be ;
In their gold coats spots you see ;
Those be rubies, fairy favours,
In those freckles live their savours ;
I must go seek some dewdrops here,
And hang a pearl in every cowslip's ear .

About this very time, Oberon, the king of the fairies, had quarrelled with his queen, Titania, because she would not give him a little Negro boy, of whose mother she had been very fond. Oberon decided to play a trick on Titania for this, and so he told Puck, his mischief-loving fairy servant, to put the magic juice of love-in-idleness into Titania's eyes as she slept, that when she awoke she would

fall in love with the first living creature she might see.

This is how the plan is laid.

Oberon : I know a bank whereon the wild
thyme blows,

Where oxlips and the nodding violet grows
Quite over-canopied with luscious woodbine,
With sweet muskroses, and with eglantine :
There sleeps Titania some time of the night,
Lulled in these flowers with dances and delight ;
And there the snake throws her enamelled skin,
Weed wide enough to wrap a fairy in ;
And with the juice of this I'll streak her eyes,
And make her full of hateful fantasies.

Take thou some of it, and seek through this
grove :

A sweet Athenian lady is in love
With a disdainful youth ; anoint his eyes ;
But do it when the next thing he espies
May be the lady. Thou shalt know the man
By the Athenian garments he hath on.
Effect it with some care, that he may prove
More fond on her than she upon her love.
And look thou meet me ere the first cock crow.

Puck : Fear not, my lord, your servant shall
do so.

And here is the guardian song the
fairies sing while Titania sleeps.

You spotted snakes with double tongue,

Thorny hedge-hogs, be not seen ;

Newts and blind-worms, do no wrong ;

Come not near our fairy queen.

Philomel, with melody,

Sing in our sweet lullaby ;

Lulla, lulla, lullaby ; lulla, lulla, lullaby :

Never harm,

Nor spell, nor charm,

Come our lovely lady nigh ;

So, good-night, with lullaby.

Weaving spiders come not here ;

Hence, you long-legged spinners, hence !

Beetles black, approach not near ;

Worm nor snail, do no offence.

It so chanced that a company of rough workmen were rehearsing in that wood a little play which they were to perform at the wedding festivities of Duke Theseus, and by a magic touch Puck changed the head of one named Bottom, a weaver, into that of an ass ! This ungainly man with the ass's head was the first thing the lovely queen of the fairies saw when she had rubbed the sleep from her eyes, and, thanks to the

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juice of love-in-idleness, she straightway fell in love with Bottom, wound her arms about his neck, bound flowers around his flapping ears, and bade her fairy attendants obey his every wish.

Puck had also been told by Oberon that an Athenian who was lost in the wood was neglecting his true love for a maiden who shunned him, and he bade the mischief-making fairy change the heart of this misguided Demetrius. But Lysander and Hermia, wearied with their walk from Athens, were lying down to rest when Puck came flying past, and, mistaking Lysander for Demetrius, the fairy squeezed the magic juice into his eyes. Then, Helena coming up as Lysander awoke, he immediately told her of his love for her. The charm had worked on the wrong lover.

Lysander now left Hermia, and followed Helena, who always fled from him, as she still loved Demetrius. Presently, while Oberon and Puck were roaming in the wood, they found poor Hermia trying to dismiss the persistent Demetrius. On discovering that this was the Athenian of whom Oberon had spoken, Puck at once repaired his mistake by charming the eyes of Demetrius, who, seeing Helena next, straightway fell in love with her. But imagine the dismay of Helena when she thought that both Lysander and Demetrius were mocking her in now pretending to be in love with her! Happily, what the

magic love-juice could do, it could also undo, and another drop of it from Puck soon restored Lysander to his Hermia, and happiness to them both.

Oberon, in the meantime, had begun to regret the trick played upon his queen, and, having obtained the little black boy from her while she thought herself in love with the donkey-head, he made her believe that she had only been having a foolish dream, and restored her eyes to their usual sense, agreeing that they would never quarrel again. Bottom the weaver was also made happy by getting his own head back, though he had been happy enough with the ass's head.

The sound of a horn rang through the wood: Theseus and Hippolyta were out hunting. They came upon Helena and Demetrius, Hermia and Lysander, all of them happily reconciled to one another; and when Egeus reminded the Duke that this was the day for Hermia to make her final choice, Demetrius told how his love had changed, saying:

And all the faith, the virtue of my heart,
The object and the pleasure of mine eye,
Is only Helena.

So Lysander had no longer a rival for the hand of Hermia, and to celebrate the day with merriment they all went to the palace to watch the working-men's play in which Bottom the merry weaver was the principal actor.

THE TEMPEST

LONG ago, on a bare and lonely island in the Mediterranean Sea, there lived three people. One was a wise old man named Prospero, who had with him his beautiful young daughter Miranda. The third was their servant Caliban. But, although there were only three people, Prospero had yet another servant—a tricky sprite named Ariel.

Ariel loved his master dearly, because he had once been imprisoned in the heart of a pine tree, and Prospero, who knew the secret of many mysteries, had rescued him from that strange prison, in which Ariel had been secured by the magic of an old witch named Sycorax, who once lived on the island. Caliban was her son; a creature so ugly as to be scarcely human.

It happened that one day when Miranda was looking out at the wild, storm-tossed sea, she saw a vessel in distress, and

knowing that her father had learned the secrets of magic power, she begged him to calm the sea and save the poor sailors from death. But he answered that he himself had caused that very storm to rise, and calmed her fears by promising that nobody would be drowned. The story he then told her was strange indeed.

"Twelve years ago," said he, "I was the Duke of Milan, but I cared nothing for wealth and power and fame. I was happiest only when with my little child and my books. My brother, your uncle Antonio, to whom I left the government of the State, was not like me, and, greedy of power and possessions, he wanted my dukedom for himself. To this end he went to the King of Naples, then an enemy of mine, and promised that if the King would help him to steal my lands he would richly reward him. It was so

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agreed, and one night these enemies of mine secured both you and me, and hurried us away into an old ship that could scarcely float. Happily, some good friend saw that the boat contained no lack of useful things, and, above all, my beloved books, which have been of so great comfort to us since our leaky vessel floated to this uninhabited island. And now the tide of fortune is turning, for, by means of the wisdom I have gained, my ancient enemies, all of whom are in that storm-tossed ship, will soon be delivered into my hands."

Even while Prospero was talking his fairy servant Ariel had made himself invisible—for, of course, he could do anything that fairies do, and might even have crouched inside a little girl's thimble. He beached the ship in less time than fifty sailors could have done it, and he brought the crew to shore, though no one could tell how. He next took Ferdinand, the son of the King of Naples, apart from the others, leading him to where Prospero and Miranda were—perhaps just by whispering in his ear! There is no outwitting a fairy like Ariel, unless one happens to be a witch, like Sycorax.

As soon as Miranda set eyes on the Prince she fell in love with him; and he, well, he thought he would never be happy without her. Prospero noted this, and he was delighted; but he desired to test Ferdinand's love, and pretended to treat him as a spy. But, Ferdinand having won Prospero's confidence, that magician gave the young prince and Miranda an exhibition of his art, by showing them a play performed by spirits doing his bidding. Nymphs, under his command, danced and sang. Then suddenly to the accompaniment of a strange and confused noise, they vanished.

Prospero had ordered them away, as he remembered that the time had come when Caliban would be plotting against his own life, and he must be on his guard. Ferdinand was astonished at the swift change, but Prospero calmed any apprehension he might feel:

You do look, my son, in a moved sort,
As if you were dismayed; be cheerful, sir;
Our revels now are ended. These our actors,
As I foretold you, were all spirits and
Are melted into air, into thin air,
And, like the baseless fabric of this vision,
The cloud-capped towers, the gorgeous palaces,

The solemn temples, the great globe itself,
Yea, all which it inherit, shall dissolve
And, like this insubstantial pageant faded,
Leave not a rack behind. We are such stuff
As dreams are made on, and our little life
Is rounded with a sleep.

Then, with the help of Ariel, he confounded Caliban's treacherous plotting.

In another part of the island the King of Naples and his companions rescued from the ship were lying asleep, but the King's own brother Sebastian, and Antonio, the usurper of the dukedom of Milan, were awake and plotting to kill the King, in order that they might obtain his possessions if they got back to Italy. But they reckoned without the tricky Ariel, whose wise master had sent him to watch over the King. This lively but invisible little sprite sang in the ear of Gonzalo, the kind old nobleman who had provided Prospero with his books and valuables when he was sent adrift, and this was what he sang:

While you here do snoring lie,
Open-ey'd conspiracy
His time doth take.
If of life you keep a care,
Shake off slumber and beware:
Awake! Awake!

Up started Gonzalo, then the King awakened, and they decided to set out to look for Ferdinand. So the evil designs of Sebastian and Antonio were ruined by Ariel, who led the company to a cave, outside of which Prospero had drawn a magic circle.

When they were all standing spell-bound within this magic circle, Prospero, dressed in the rich clothes he had brought from Milan, appeared before them. His old enemies were in doubt as to whether this might not be his spirit, but he told them his strange story, and said that he forgave them all freely.

The King of Naples now told Prospero that he had lost his son on the island, and Prospero, smiling, said he had just lost his daughter. Then, leading the party into the cave, he showed them Ferdinand and Miranda, who were playing happily together at chess.

So pleased was Prospero with the good services of Ariel that he set the faithful fairy free before the whole party sailed away for the wedding of Prince Ferdinand and Miranda.

The Story of the Most Beautiful Book in the World



WHAT HAPPENED AT ANTIOCH

WHILE the humble community of Nazarenes in Jerusalem were still agitated by the action of Peter in admitting to baptism a foreigner outside the Jewish religion, news of a much more disturbing character reached them from the city of Antioch.

Antioch was at that time one of the three capitals of the world. Its situation was magnificent, its buildings were of great splendour, its streets were unequalled for grandeur. The population was composed of all nationalities.

Among the many races of people inhabiting this great city were several of those Nazarenes who had been driven from Jerusalem by the furious persecution of Saul.

These humble Jews brought with them into Antioch the mustard-seed of Christ's kingdom, destined, as it grew up, to spread its branches over the whole Earth. They worshipped Jesus in secret, and in their intercourse with neighbours gradually spread abroad the narrative of Jesus, his teaching, his death, his resurrection. Nothing could have been in greater contrast than these humble Nazarenes, with their worship of Christ's beautiful character, and the average inhabitants of Antioch. This superb city, the third capital of the world, with its marble-paved streets, its avenues

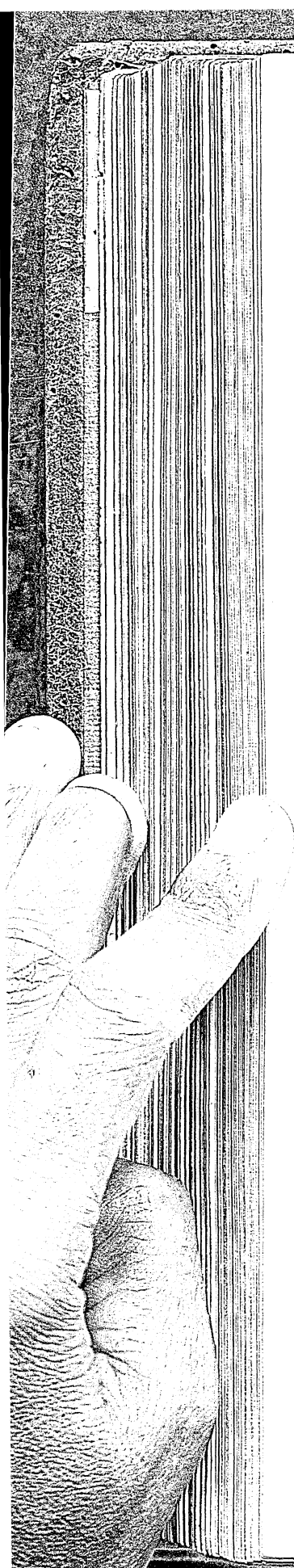
adorned with colonnades and statues and shaded by plane trees and palms, was one of the wickedest cities on the face of the Earth.

It is impossible for us to imagine the depravity of its inhabitants. There was no seriousness in the city, no idea of God, no desire for reaching the heights of intellectual or moral attainment.

We can imagine, then, that among the pleasure-seekers of beautiful Antioch there were many who had exhausted their energies and walked heavily in the glare of the noonday sun, feeling an emptiness in their hearts and a clouding sorrowfulness in their souls. With what awakening hope must these weary slaves of pleasure have heard the first whispers of Christ's ideas, the extraordinary new thought that the kingdom of heaven is within a man, that immortality is the explanation of his existence, and that the God of the universe is not a fierce Judge but the loving Father of all mankind.

With what quickening joy must they have heard the amazing idea that God desires not the death but the repentance of a sinner, that He had manifested His love to all men through Jesus of Nazareth, who had come into the world not to judge and destroy the world, but to seek and to save that which was lost.

GREAT FIGURES OF THE OLD TESTAMENT · THE LIFE OF JESUS



THE BIBLE

Can we not imagine what effect these ideas would produce in a pagan city full of sin and wickedness, and therefore full of weariness and unrest?

Happily for the history of the world, the Nazarenes at Antioch were not like the narrow Nazarenes at Jerusalem: they did not want to keep Christ to themselves, and they did not look with disdain upon foreigners. So it came about that the leaven of Christ worked in that "seething mass of atheism, idolatry, and polluted life" as a little yeast works in a mass of heavy dough, which becomes light by its influence and makes bread that is best suited for the need of men.

THE CHARACTER OF JESUS THAT BELONGED TO THE WHOLE HUMAN RACE

Among the Greeks at Antioch this new thought began to work with extraordinary energy. The Jews who worshipped Jesus still regarded him as first and foremost a member of their race; but the Greeks, with their quick brains and subtle intellects, soon perceived that the *character* of Jesus belonged to no race and to no nation, but was something which made as direct an appeal to the whole human race as the air of heaven.

Without troubling themselves about Moses and the law, these nimble-witted and soul-cultured Greeks seized on the idea, character, and personality of Christ. Once brought by the humble Nazarenes to contemplate the story of Jesus, they quickly made known the beautiful narrative to their kinsmen and neighbours, so that the ideas uttered by Jesus in Galilee began to spread in Antioch with wonderful rapidity.

THE CENTRE FROM WHICH CHRISTIANITY SPREAD ACROSS THE EARTH

How natural it is! How real it makes for us the progress of religion in the world! Palestine was a convenient centre; the Jews were the most lasting and most scattered of all the nations on the Earth; Jesus came at a moment when the Roman Empire made it possible for God's revelation to spread with lightning rapidity from one side of the known world to the other. Christianity was to have, at its outset, three capitals—Jerusalem, Antioch, Rome. The first was the root striking deep down into the soil of the Jewish race, the second the trunk embracing many nations, the third the branches overspreading the Earth.

This was the news which caused such consternation among the Nazarenes at Jerusalem, still troubled by Peter's baptism of a single Italian. Reports came from Antioch of Greeks coming into the faith of Jesus by tens, twenties, and hundreds. Instead of rejoicing at this visible manifestation of God's providence, the tiny and secret community of Nazarenes at Jerusalem were flung into a state of anxiety and concern.

There was no apostle at Antioch. Men might be there who had seen Jesus, heard him speak, and perhaps had even spoken to him themselves; but how dare these unauthorised people, whom Jesus had never commissioned to preach the Gospel, take upon themselves the terrible responsibilities of the apostles? What mistakes they must be committing! Surely a false Christ must be working in this pagan city of Antioch, so far removed from the holy city of Jerusalem!

BARNABAS, THE MAN WHO HELPED PAUL TO EVANGELISE THE WORLD

The apostles decided to send at once a trusted member of their little band to see with his own eyes and report with his own lips the condition of things at Antioch, and for this purpose Barnabas was chosen, a discreet man of noble mind, one of the most trusted of all the apostles. Barnabas went to Antioch, saw the state of affairs, realised that an immense opportunity was presented for spreading a knowledge of Christ throughout the world, and set himself to guide this mighty work.

Soon, however, it grew beyond his solitary powers, and, considering whom he could invite to help him, he remembered his old friend and fellow-pupil, Saul of Tarsus, a man of genius most suitable for working among the cultured Greeks.

He discovered Paul at Tarsus, and told him of the great events at Antioch. The heart of Paul kindled at the news. This was his call. Eagerly and gladly did he set forth with Barnabas.

Thus, twice over (says Dean Farrar) did Barnabas save Saul for the work of Christianity. To his self-effacing nobleness is due the honour of recognising, before they had yet been revealed to others, the fiery vigour, the indomitable energy, the splendid courage, the illuminated and illuminating intellect, which were destined to spend themselves in the high endeavour to ennoble and evangelise the world.

The Interests and Pleasures of Life for All Indoors and Out



FOUCAULT'S PENDULUM—HOW TO MAKE ONE

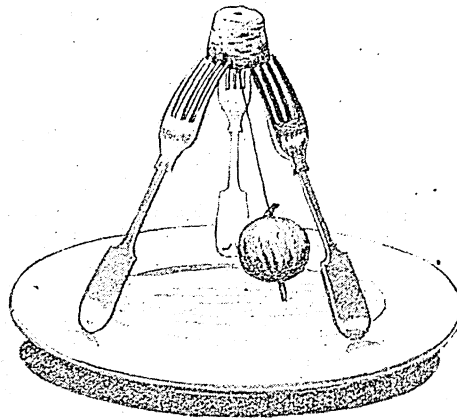
WE all know the story of Foucault's pendulum, how in 1851 the great French physicist who invented the gyroscope demonstrated the rotation of the Earth by means of a huge swinging pendulum in the Panthéon at Paris.

On a metal thread seven yards in length he attached a globe of 55 pounds weight, and underneath placed a disc divided up so that the direction of the pendulum's swing could be clearly seen. The pendulum was set swinging, and after a few minutes it veered westward, away from its original direction, thereby proving the rotation of the Earth on its axis from the west to the east.

We can perform a somewhat similar experiment for ourselves on the dining-room table. We take an apple and drive through it a thin piece of wood long enough to project at each end. One end we sharpen to a point, and to the other end of the wood we attach a thread.

We now stick the prongs of three forks into a cork to form a tripod on a plate, as shown in the picture, having first stuck a pin through the cork with the head downward. To this pin we attach the free end of the thread, adjusting the length so that the pointed wood projecting from the apple, as this swings, almost touches the plate.

We set the apple pendulum swinging, and at the two extremities of the swing arrange little piles of salt through which the point will make a furrow as it passes to and fro. The point goes through the same furrows again and again, but if we slowly and gently turn the plate round we shall find that new furrows are made, for the pendulum does not turn with the plate; it goes on swinging in the same plane as at first.



THE LITTLE MODEL COMPLETE

We have simply repeated on a smaller scale Foucault's famous experiment, the plate in our case representing the revolving Earth and the cork the roof of the Panthéon.

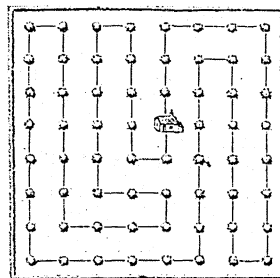
Naturally, with our crude apparatus we cannot get as accurate results as Foucault. He, by marking 24 equal divisions round the edge of his table beneath the pendulum, would have had a good clock, the direction of the pendulum marking the successive hours. Of course, the table beneath the pendulum would be found to revolve slowly in a direction opposite to that of the hands of a watch; but as the floor, walls, and whole building revolve with the table the pendulum would appear to be revolving in the same direction as the hands of a watch. It would be a case of relativity, the pendulum moving round relatively to the spectators who would in reality be moving with the room.

THE PROBLEM OF THE TREES IN THE ORCHARD

JOHN, the farmer's labourer, had to take the pail of insecticide round the orchard and spray sixty-three trees. He was to start at the shed where the spray was mixed and the spraying apparatus kept, and the farmer posted on the wall of the shed a plan of the orchard with lines drawn, showing how John was to take the trees in turn.

"This," said the farmer, "is the only way in which you can be sure of taking all the trees in turn and keeping in straight lines parallel with the sides of the field without going over any ground twice."

John, however, was of an ingenious turn of mind, and after the farmer had gone away he determined to think out another route round the orchard, which should still keep to lines parallel with the fences of the field, and go from tree to tree in turn without covering any of the ground twice.



THE FARMER'S PLAN

After a few minutes consideration he found a way, which he followed, and when the farmer returned John told him what he had worked out.

At first the farmer would not believe that John had really been successful in doing as he said, but when John showed him he acknowledged that the new route quite fulfilled the conditions he had laid down.

Take a piece of tracing or tissue paper, put it over the plan in the picture, and when you have traced the position of the 63 trees, with the shed and the fences bounding the field, see if you can find a new way of going from tree to tree, starting and ending at the shed, and keeping all the time in lines parallel with the sides of the field, never going over the same ground twice. John's solution is given in Section 52 of Group 18.

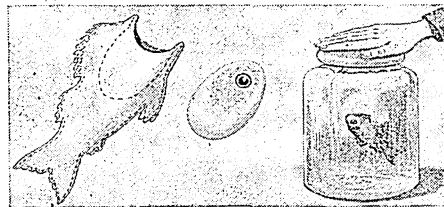
THE FISH THAT COMES WHEN CALLED

WITH care a fish can be made which, placed in a jar of water, will move up and down at will.

The first step is to take a small egg and blow the contents out so that the shell is empty. This we do by making a little hole at each end with a pin, and blowing the contents into a saucer or cup. Then we carefully seal up the hole at the bigger end.

We now draw on each side of the other end of the egg-shell a good-sized round eye, with a ring round it, using Indian ink so that it will not run in water. The next step is to cut out two pieces of red stuff in the shape of the body of a gold-fish, with tail and fins complete.

Now we must get needle and cotton and sew these together, not only all round the edge, but also in the manner shown in the picture, so as to form a bag into which the blunt end of the egg can be inserted and sealed up carefully with red sealing-wax.



MAKING THE MAGIC FISH

Before sealing the bag to the shell we must ballast it with small shot, so that it will keep right side uppermost in the water and with the head of the fish pointing upward.

Now we take a two-pound glass jam-jar and fill it with water, placing the fish inside and tying tightly over the jar a piece of india-rubber. The ballast should have been so arranged that when the jar is not being touched the fish rests at the surface of the water.

By pressing with the hand on the india-rubber the fish may be made to sink, and by releasing the pressure it may be made to rise again.

The explanation is that the pressure on the rubber covering causes a little water to enter the hole in the shell, and the release of this pressure allows the air in the shell to expand and force the water out again, thus lightening the egg and causing it to rise once more.

ANSWERS TO PICTURE PUZZLE ON PAGE 6174

ON page 6174 we have a drawing of a large steamer beside a quay, and in it the artist made several mistakes. Here is our list of them.

1. There is no name on the bow.
2. The portholes open outward instead of inward, as they should open.
3. The scupper is drawn to open the wrong way.
4. The rope-ladders are unfinished.

5. The numbers should read upward.
6. The foremast is leaning forward instead of backward.
7. The funnels also should lean back.
8. The waste steam pipes should be in front of the funnels.
9. The anchor-chain hole is the wrong way.
10. No ship in dock has an anchor down.
11. There are no ventilators, halyards, or foretop-mast stay.

HOW TO WATCH THE UNFOLDING OF LIFE

It is very interesting to watch the unfolding and development of life in the growth of a bean.

Of course we cannot do this when the bean is put in the earth, but by a special apparatus made out of a glass jam-jar, a piece of blotting-paper, and some moss, we can keep the growing bean under observation and see the changes that take place from day to day.

We cut the blotting-paper to make a roll that will exactly fit inside the jar. Then we put in some damp moss, arranging it fairly loosely, and the beans are placed between the glass and the blotting-paper. Ordinary French or dwarf beans will do, and a series of them can be placed round the inside of the jar. They may be pushed into position with a hairpin.

Before placing the beans in the jar it is best to soak them for twenty-four hours in water, and it is interesting to watch the changes that take place during this soaking. The skin becomes wrinkled round the edge, and finally the wrinkles spread all over the surface, while the bean itself swells considerably. Gradually this swelling fills out the coat till the skin once more becomes quite smooth. It is now in a very fit condition to be experimented upon.

Soon after the bean is placed in the jar it begins to show signs of life and growth. First of all, the slender white root appears on the concave, or dented, side; and no matter what the position of the bean may be, the root will grow downward, turning round if necessary for the purpose. To see this properly, it is a good idea to arrange the various beans in different positions when we put them in the jar, some having the concave

side uppermost, some with it downward, and others with the ends on top.

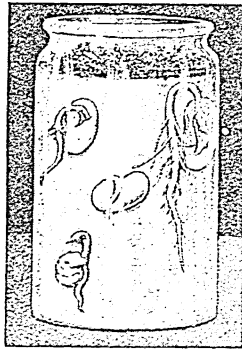
The root having appeared, the outer coat of the bean cracks and comes off, and we can then see that the stem is a continuation of the root, and has two rudimentary leaves at the end. The stem grows quickly in a loop or arch form, and the growth from this point is best studied by removing the loose skin and splitting the bean into two. This is easily done with a penknife, but we must take great care not to injure the little plant inside. After removing the side of

the bean that has nothing attached we examine the other half, and can then see the embryo, or young leaves, quite plainly. They are carefully folded together; but, if the half-bean can be replaced in the jar next to the damp blotting-paper, the stem soon begins to grow upright and the leaves unfold.

If a glass lamp chimney is used instead of a jam-jar we shall be able to study the growth much better, for the chimney, being taller, allows much more height and depth for the development of the root and stem.

The experiment can be made much more interesting if we use different kinds of seeds, and compare their growths. Beans, peas, maize, sunflower seeds, and acorns may all be used for this purpose, and to study these carefully as they develop is quite an education in botany.

In all cases the moss must be kept quite moist though not very wet, and, while the seeds in the jar are germinating, they should be kept in a fairly warm atmosphere. The heat must not be very great, however, or the moss gets dried up too quickly. Wet sawdust may be used instead of moss.



The Beans in the Jar

A SPRING MATTRESS FOR A CAMP BED

WHEN we camp out and have to sleep on the ground we probably find the ground rather hard after sleeping on a spring mattress at home.

But if we have access to plenty of trees or faggots, it is easy to make a spring mattress that will serve well during the time we are camping, and be almost as comfortable as our bed at home.

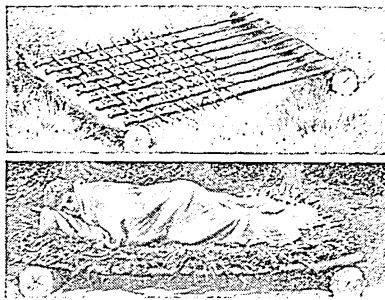
All we need are two logs about four feet long and six inches in diameter, a number of seven feet lengths of green sapling, more or less uniform in thickness, say, an inch-and-a-half in diameter, and finally a quantity of small twigs and plenty of bracken.

Having placed the two logs in position, as shown in the picture, we lay the saplings on them, three or four inches apart, and nail or

tie them down to keep them from shifting. The saplings should previously have been trimmed with a jack-knife to remove all projecting knots, and it is a wise plan to place at the outside on each side of the bed a rather stouter sapling.

All we now have to do is to interlace the twigs with the saplings and cover with leaves or bracken, and we have a really comfortable,

springy bed. The air is able to circulate underneath, and this makes the bed much more healthy than one built on the ground.



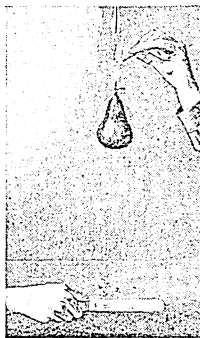
CUTTING A PEAR IN TWO

A VERY good little exhibition of so-called magic can be given by means of a trick known as The Pear Which Divides Itself.

A pear is hung up, say, in a doorway or on an electric light bracket, and we undertake to hold a sharp knife in exactly the right position underneath so that, when the pear is allowed to fall, it will drop right on top of the knife blade and divide itself into two.

Of course, the higher the pear is hung the more wonderful will be the feat, and that it should be at a considerable height is necessary for success. It is also important that the knife should be very sharp and the pear a fairly ripe one that will cut easily. We hold our knife ready in position, word is

given to set light with a match to the string that holds the pear, so as to release it and allow it to fall without any swing, and, wonderful to relate, the pear drops right on top of the knife edge and is severed.



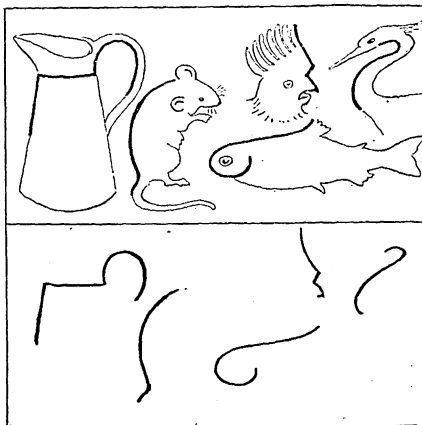
Of course it is by a trick that we know just where to hold the knife, and the secret is this. Before our friends come we hold up a basin of water so that the bottom of the suspended pear dips into the fluid. Then we remove the basin and a drop or two of water falls on to the floor beneath. We secretly mark the spot with a pencil mark, and this is where to hold the knife, as the pear must fall on the exact spot if it is not swung but is released in the way described. The picture shows the pear about to fall.

HOW TO PLAY SQUIGGLES

AN excellent drawing game is that of Squiggles, which may be played by any number of people, and does not require any great artistic skill, though it gives scope for ingenuity.

Taking a sheet of paper we mark on it a number of rough outlines made up of curves, straight lines, and angles; and, using these outlines as parts of a drawing, we have to add as few other lines and marks as possible to complete a picture.

There is no restriction or limit as to what object our picture is to represent, but the outline must form an integral part of the drawing we are going to make.



The first player takes the first outline; three or four minutes are allowed for the drawing, and then the paper has to be passed on to the next player, who uses the second outline, and so on.

If we prefer it, we can make the outlines on separate sheets of paper, shuffling them up and allowing each player to draw one from a hat or box. In drawing the outlines no attempt should be made to let these represent part of any object. The more indefinite and arbitrary they are, the greater the ingenuity required to turn them into complete pictures, and the greater the fun.

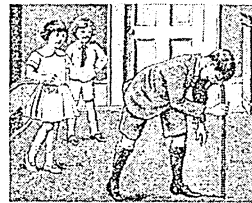
TRYING TO GET TO THE DOOR

HERE is a splendid game to play at a party where plenty of people are present. It is one of those simple things that everybody thinks he can do quite easily, yet when he attempts it he finds it impossible.

The idea is to turn round three times in the middle of the room and walk to the door and touch it. Simple as it sounds, not one in a hundred can do it.

We take a walking-stick and, putting our right hand on the top and bending down, we place our forehead on our hand and then walk round the stick three times, keeping our eyes wide open and looking at the floor as we do so.

Then, rising up quickly and releasing the stick, we try to walk to the door and touch it. But we find this to be impossible.



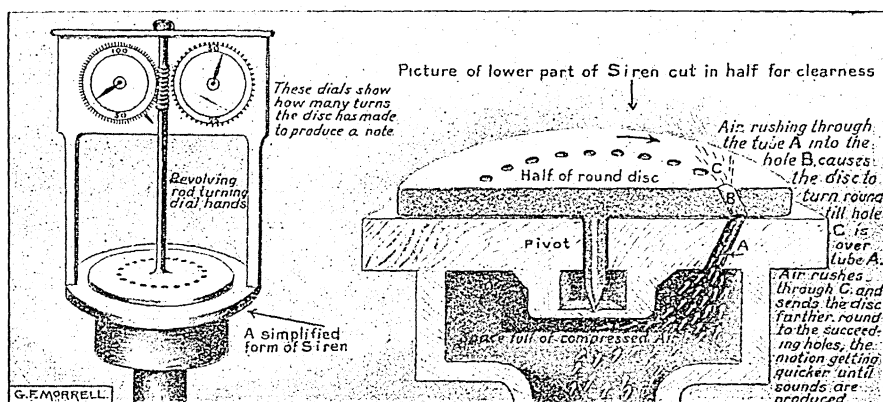
Staggering in our gait, we cannot help moving in quite a different direction.

The explanation is that we have made ourselves so giddy by turning round the stick that it is impossible to walk straight.

In playing this game there are one or two things that must be carefully borne in mind. In the first place it is essential that when walking round the stick we keep our eyes wide open and look at the floor. Secondly, the stick must be kept as upright as possible, with its point in the same position on the floor all the time.

Thirdly, we must walk steadily round, and not run; and lastly, it is advisable to have someone handy to prevent the giddy person from running into tables and chairs, and either hurting himself or upsetting the furniture.

The Story of the Boundless Universe and All Its Wondrous Worlds



This picture explains how the siren works. As the disc revolves, the holes are brought in rapid succession over the tube A, and the puffs of air passing through these holes produce a loud sound. The dials record the turns of the disc, from which the number of puffs and sound waves can be calculated.

WONDERFUL, WONDERFUL MUSIC

THE great art of music, though it is an art meant to be beautiful and to move us, is a strict science having perfectly definite laws based on the facts of sound.

The music of long ago consisted entirely of melody—that is to say, tunes which are usually very simple, but have only one note sounded at a time. We know, however, that it is very pleasant to the ear sometimes to hear two or more notes sounding at one time; we know, also, that sometimes it is very unpleasant. When the sound is pleasant we call it a harmony; when it is unpleasant we call it a discord.

The greater part of the progress in modern music depends on the progress in harmony, and all present-day lovers of music would be very sorry to have to be limited to melody, now that it is possible to add so much to it by means of harmony.

It is extremely interesting to discover, if possible, what makes harmony and what makes discord. The difference to our ears is very great, and there surely must be some rule that materially affects the nature of the sound, if only we could find out what that rule is. Again, it is very interesting to notice that there are certain kinds of harmony where the notes sounded together seem so much alike that

we do not even speak of them as making a harmony. For instance two different C's on the piano have certainly not the same sound, yet they are so like each other that when they are sounded together it is very much the same as if we were listening to one of them, only the sound is rather richer and fuller.

Now, we might very easily suppose that our feeling that there is a sort of likeness or family resemblance between notes would depend on their being near to each other. Yet a C sounds very like another C, even, perhaps, two or three octaves away, and intensely unlike a note next to it, such as B or C sharp. This we soon notice if we sound two notes next to each other together. All ears are quite agreed about this, and there must be some explanation of it.

The great law is that the ear judges by relations, or, to use the proper word, *ratios*. When we compare any harmony with any discord, the difference is in the ratios, or relations, between the numbers of the notes. We know that every possible musical note means a definite number of air waves striking the ear in a single second of time. On the relations between

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those numbers all harmony and, indeed, all music depend. The simplest possible relation between two numbers is plainly the relation of two to one. Nothing else could be quite so simple as that, unless the two numbers are actually the same. Now this relation of two to one gives our ears the impression of the closest resemblance and harmony that are possible. Two notes making an octave have this relation between them, and no matter whereabouts in the scale we take them, high or low or in the middle, they will always have the same effect on the ear. One note may have 24 vibrations a second, and the other 48, or the numbers may be 15,001 and 30,002, but their ratio is as one to two, and so the one sounds almost like the double of the other. Siren experiments with notes of any pitch show similar results.

All modern music is based on this fact, and, by filling in the interval between the one note and the other with a varying number of other notes chosen in a certain way, we form what is called a scale.

Nothing would be easier than for a player on the violin to play a scale or any number of scales which we should call simply hideous. On the other hand, there are certain scales which the ear likes very much. Some of them have the effect of being mournful, and some of being untroubled or even gay.

THE MUSICIAN'S A B C, THE SCALE OF NOTES ON WHICH ALL MUSIC IS BUILT

Ever since music began, and in all parts of the world where it has existed, it has depended on the use of a scale, or set of notes. For instance, one set of notes was used long ago in England and in Scotland, certain sets were used in Greece, and certain sets are used today in India and Japan.

In every case the particular set or sets of notes make up the material or alphabet of the musician. A clever musician can at once tell when he hears a tune, like one of the beautiful old Scottish tunes, to what period it belongs and from what place it came, because he recognises the scale from which the composer has chosen his notes.

Let us first look at the ordinary scale that we can play on the piano by simply touching the white notes from C to C. To our ears, accustomed from our earliest years to hear this scale, and to hear tunes made from it, this sounds natural, and any other scale at first sounds rather peculiar, and less natural. But every musical scale has its definite laws, always to be found by

studying the vibration numbers of the notes that make it. To this we must add that the numbers themselves are of no importance; the whole point is the relation between them. Any kind of scale may start on a note of any number, but all the other notes in the scale will have a fixed relation to that number, and those relations make the scale. We shall recognise it, and it will have the same effect on our ears whether it is played in a low key or a high one; it will really be the same scale, whether played by a bassoon or a flute or a violin. What it is that makes the difference in these cases we shall afterwards study.

THE RELATION BETWEEN THE DIFFERENT NOTES OF THE SCALES

It is quite easy to write down exactly the ratios of all the notes in the ordinary scale of C major, which most of us know so well. Let us suppose, just for the sake of the argument, that the lower C happens to have a vibration number of 24 per second; it might just as well be 25 or 250½ per second. But 24 is a convenient number, and, if it be 24, then we can find out exactly what all the other numbers will be. Here they are set out in order and showing their relation:

C	D	E	F	G	A	B	C
24	27	30	32	36	40	45	48

Now, there is no point in these numbers themselves, but there is point in the relation existing between them. The first thing we notice, of course, is that the ratio between the two notes that make the octave is the ratio of 24 to 48, and that is the ratio of 1 to 2. The next simplest ratio that we can notice is that of C to G, for C is 24 and G is 36, so that the ratio is that of 2 to 3. One more ratio we may note, the ratio of C to E, which is that of 24 to 30, or 4 to 5.

Now, if we take these notes that we have observed, C, E, G, C, we find, to begin with, that they make the common chord, the sound of which we all know so well, for most pieces of music end with it. If it comes in the middle of a piece of music, we are apt to think that we have reached the end.

THE COMMON CHORD THAT MOVES MEN ALL OVER THE WORLD

That is the peculiar quality of this wonderful chord; it sounds final. After other combinations of notes the ear expects more. But the ear is always content with this; it requires nothing

WONDERFUL, WONDERFUL MUSIC

to finish it or to carry it on. Now, in the case we have chosen, the vibration numbers of these four notes are 24, 30, 36, and 48. If we reduce these we see that the ratios are those of 4, 5, 6, and 8. Now, it does not matter where we hear a common chord, or what note it starts on, the ratios of the four notes making it are always those of 4, 5, 6, and 8.

This is really very wonderful. If we look at 4, 5, 6, and 8 on a piece of paper and study them, we are studying arithmetic, a simple branch of mathematics. As everyone knows, this science of num-

bers is distinguished from noise; it means harmony as distinguished from discord; and it has the peculiar quality of saying, "This is the end," not merely pleasing the ear, but satisfying it.

If we went farther into the matter we should find that there are other ratios which always tell the ear that there is more to follow, and make the ear positively long for what is to follow; yet the absolute difference between these two qualities depends on abstract arithmetic—the difference between the ratio of one set of numbers and the ratio of another set.



THE VILLAGE CHOIR—FROM THE PAINTING BY THOMAS WEBSTER

bers and figures is to many people the driest and most abstract in the world, yet its laws apply directly to some of the deepest and most wonderful feelings of which we are capable. Considered in themselves, the ratios 4, 5, 6, and 8 are quite dry; they seem to have nothing to do with mankind. Yet all over the world, in all ages, men have only to hear this ratio made in sound waves, and they always receive a certain set of definite impressions. To trained and untrained ears alike the ratio means music as distinguished

These simple facts, so well known to all musicians and students of sound and of the ear, are full of the highest meaning if we have wisdom to see it. Anyone who had not thought wisely and deeply about the world would have supposed that no two things could be farther apart than, on the one hand, our feelings of yearning and satisfaction, or sadness and joy, and, on the other hand, the arithmetical ratios between a certain set of numbers. Yet these two utterly different and unrelated things, as they seem to be, are eternally

EARTH AND ITS NEIGHBOURS

bound together by the laws of Nature and of man. Let us now print again the notes of the scale and their vibration numbers in the case where we happened to start with 24, and underneath these let us print the ratios of these numbers :

C	D	E	F	G	A	B	C
24	27	30	32	36	40	45	48
1	$\frac{9}{8}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{15}{8}$	2

We notice that these fractions vary in simplicity. The simplest is the fraction corresponding to G, and the next simplest is that of E, which is just half-way between C and G. These give us the common chord. It is very interesting to notice that one fraction in the above list is very decidedly less simple than any of the others—that is the fraction $\frac{15}{8}$, corresponding to the note B in the scale of C.

Now, we are all quite able to sing a scale, and it is quite natural to us to strike the last note but one, which in this case is B. But when we have noticed that this ratio is really the least simple of them all, it is very interesting to learn from the history of music that this particular ratio had to be discovered.

THE NEW MUSICAL NOTES THAT WERE DISCOVERED IN RECENT TIMES

It appears that, to whatever part of the world we go, we find a time when the ears of musicians had not discovered this ratio as a way of getting from A to C. So they stopped at A. Very often, also, they had not discovered the ratio $\frac{4}{3}$, which corresponds to F. So it was that they had simply a scale made of five tones: C, D, E, G, A. This is the very famous five-tone, or *pentatonic*, scale, which we may say was the great scale of music until comparatively recent times, and the discovery of F, and more especially of the difficult ratio B, from which the scale can climb to a note exactly double of the note it started with, and so finish beautifully.

There is no end to what might be learned about the different kinds of scales, but what has been said gives us the key to the wonderful facts; and we discover that music, this great art which, at its best, affects us so deeply and nobly, may really be looked upon as a branch of applied mathematics, an application of the laws of the ratios of numbers.

When we are playing a scale of any kind on the piano or on the violin, or when we are singing it, perhaps one of the notes

we make sounds quite wrong, and we say that it is out of tune. What does this mean? There is nothing the matter with the note itself, remember, though, occurring where it does, it sounds so unpleasant that we are apt to think so. It may in itself be a lovely note, rich and clear, brilliant or tender. Nevertheless, where we hear it—perhaps in a scale or in the course of a song or a piece—it is dreadful.

WHAT HAPPENS WHEN THE PIANO IS OUT OF TUNE

The reason is that the vibration number of that note does not have the ratio it should have to the other notes. It is out of tune with them, or we might say that they are all out of tune with it. Anyhow, the ratio is wrong. If it is wrong because the vibration number is too small, we call the note flat; if the vibration number is too high, we call the note sharp.

One of the commonest mistakes in singing and in playing the violin is to make the notes flat. No matter how beautiful the voice or the tone of the violin, no matter how expressively played, no matter how good the rhythm, how well judged the varieties of time or anything else, no one can forgive music that is out of tune. Everything else may be right, but if the arithmetic is wrong, the result is not music but simply a miserable parody of it.

HOW FIVE NEW NOTES WERE ADDED TO THE ORDINARY SCALE

It is right to ask what is the meaning of the black notes on the piano, lying here and there between the white ones that make the scale of C. What has happened is that, in the course of the development of music, the first great stage in the development of a scale has yielded to a second. The first great stage was when the five-note scale was improved into the ordinary scale we know so well. We are quite right to say improved, because nothing was lost in the process. The five-note scale is still there, of course, included in the other.

The next great stage was to add five more notes at certain places in between pairs of the notes of the ordinary scale. If now we play all these notes in order on any instrument we get exactly the same sound and result as when we play all the notes on the piano, one after the other, including

WONDERFUL, WONDERFUL MUSIC

the five new black notes with the older white ones.

The arrangement of this new scale is such that the distance between any two notes is much less than it is in the simpler scale. For instance, if we look at our table, at E, F, and G, we see that from E to F it is only half as wide a space as from F to G. Well, in the new scale with the black notes, a black note, which we call F sharp, has been put in between F and G, so that the intervals from E to F, from F to F sharp, and from F sharp to G are equal. The older scale, made by the white notes, is known as the *diatonic* scale, and the newer one with the black notes included is called the *chromatic* scale.

THE KIND OF TUNES THAT CHILDREN LIKE AND UNDERSTAND

If now we compare the three scales, pentatonic, diatonic, and chromatic, we can understand something of the development of music. Not a very great amount of variety can be yielded by the oldest simple scale. This is not to say that the results may not be lovely, because they often were; only they were limited. It is this lack of variety that makes the difference between the diatonic scale and the chromatic scale.

During the last hundred years or so the chromatic scale has been used to a greater extent as the basis for composition. It is easy to understand that when children are learning music the tunes they enjoy and understand first are based on the simpler scales. Practically everyone enjoys these tunes, but it is only a comparatively small proportion of people who care for tunes built on the chromatic scale. Some people will say of a modern piece of music that there is no tune in it, but others, whose ears are better developed musically, know very well that there may be tunes in the newer music as well, only they are built on a less simple scale.

THE SECRET OF THE FIDDLE AND ITS STRINGS

If we chose to write all music down in the form of arithmetical ratios, which might be done, it could doubtless be shown how people can be classed according to the development of their musical ear by nature and education, beginning with those who can follow simple ratios like 2 to 1 and 3 to 2 and 5 to 4, and ending with those who can follow the

more difficult ratios that are used so much in modern music.

String instruments are so valuable in music, and the behaviour of stretched strings is, in any case, so interesting that it has been very carefully studied. If we look at a violin, and notice how it is used, we shall see that there are three facts about a string which decide the rate at which it vibrates.

To begin with, we notice that the strings which make the lower notes are thicker than those which make the higher. This is because of the law that the rate of vibrations of a heavy string is less than that of a light string. The heaviness, or rather, the mass, of a string will depend partly on the density of the material and partly on the thickness of it. Secondly, we notice that it makes a difference to the violinist how tight his strings are.

When he tunes his instrument he is turning the pegs which decide how tight the strings shall be. The tighter the string the more quickly it vibrates, and the higher the note becomes. If we increase the tightness by 4, the string vibrates twice as often; if by 9, it vibrates 3 times as often—4 being 2 multiplied by itself and 9 being 3 multiplied by itself. That is the law for all cases.

THE NOTE THAT IS DIFFERENT ON DIFFERENT INSTRUMENTS

Lastly, we notice that when the violinist plays he is constantly moving the fingers of his left hand and pressing on the strings. This is simply the most convenient way of altering their length, because when he presses on or stops a string at any point, it is just as if the string stopped there altogether.

We also notice that when he is playing high notes his fingers come farther and farther down, to make the strings shorter and shorter. The shorter the string the higher the note.

There is a deeply interesting question which we have not yet discussed at all. Let us suppose that the C of the piano is 24, as we did before. Now, we may have an organ and a violin and a voice, and many other kinds of instruments, all sounding this same note, and yet the sounds are very different. Everyone would instantly know which was the note made by the violin and which was the note made by the piano.



EARTH AND ITS NEIGHBOURS

Clever people, too, can tell one piano from another, and it is often easy to tell one violin from another, and we can all tell the voice of one friend from that of another; this is true even though it is the same note that is being sounded in all these cases, and it is very interesting to discover where the difference lies.

THE MUSIC OF THE SIMPLE WAVES AND THE MUSIC OF THE MIXED WAVES

To begin with, there are some kinds of musical instruments where the differences are not to be found. Tuning-forks, for instance, professing to sound the same note, really do sound the same note, without the difference that there is between a cheap violin and a good one. On careful study we find the reason for this difference. In the case of a tuning-fork the sound waves are perfectly simple; but in the case of a violin or a voice or a piano or an organ-pipe, it is rather as if the waves were like big billows of the sea with little ripples on them, and with perhaps tinier ripples on these ripples, if our eyes could see them.

Now, it makes a very great difference to our ears whether sound waves are simple, like a line simply waving plainly up and down, or complicated, with all sorts of smaller waves mixed up with the main wave. All the sounds that are valued in music are made up of these mixed waves. The main wave is called the fundamental note or tone, and all the other smaller waves which go with it are called over-tones or harmonics.

WHY DIFFERENT INSTRUMENTS MAKE DIFFERENT SOUNDS

These over-tones are equally interesting to the student of sound and to the student of music. It is the quality, the number, and the relative loudness of the over-tones that make the difference between one instrument and another, and one voice and another, even though they are all sounding the same fundamental note. This means that nearly all the musical notes we hear are really not single notes so much as combinations of notes. They are really harmonies, only we scarcely notice them as such because the lowest note of the chord is so very much louder than all the others; yet they are, and they make all the difference between the sound of the violin or of the piano, the voice of one friend and that of another.

The great interest of music written for various instruments and for various kinds of voices consists in the endless variety that we are able to get by using one instrument with another kind of instrument which has different over-tones. Whatever the instrument employed, we desire that its over-tones shall be many and rich and harmonious. This is most notably true in the case of the violin and the human voice.

We all know that some violins, made many years ago, are worth thousands of pounds, while others may be worth as many pence or less, because, no matter whether we have the same player, the same bow, and the same strings in the two cases, the one violin will make a rich, lovely musical tone, and the other a thin, scratchy noise which would scarcely be called music by anyone.

All this is wholly a question of over-tones. Somehow or other, one and the same string, played by the same bow, by the same hand, in the same room, produces lovely tones or ugly tones in the two cases, though the name of the note is the same.

THE SECRET OF THE WONDERFUL FIDDLES OF OLDEN DAYS

There is something, then, about the body of the violin which makes all the difference, and this is now understood. The string is making not only the big main wave itself, but also the little waves. The secret of making the sound lovely is to have near the string something which can be made to vibrate when the string does, and it must be something which has the power of picking out from the string-waves just those over-tones which the ear likes best; then the tone will be enriched. In the wonderful violins of old days the front and the back of the body seem to be made of exactly such size and shape and curvature and thickness that they both resonate in just the same way and to just the same notes. They help each other instead of fighting against each other, and that is their secret.

Now that we have learned something about the secret of the success attained by the famous violin-makers of the past, we may be able to understand why their instruments are so highly prized. Age may have something to do with their value, but material and design are probably the deciding factors.

The Story of Immortal Folk Whose Work Will Never Die



A. H. Becquerel



Von Helmholtz



Sir E. Rutherford



Gay Lussac



Sir W. Ramsay



Lord Rayleigh



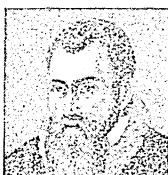
Baron Berzelius



J. P. Joule



J. B. Dumas



John Napier

THE EXPLORERS OF MATTER

IT has been said that the modern science of matter exists because, in the year when Galileo died, Isaac Newton was born ; and the meaning of this saying is that the great Italian founded a method of exact measurement which the genius born in England in 1642 inherited and carried on.

There were great thinkers before, but those two observers, the Italian and the Englishman, held that, complicated as the problems of Nature and of Matter may be, they can be solved if we confine ourselves to a bit at a time, an exact and *measurable* bit, and if we follow up our exact measurements by exact and mathematical reasoning, never taking anything for granted that cannot be proved.

Yet even when we speak of these tremendous intellects we are called on to remember that in science every step upwards follows on one that has been taken before, and they could not have done their work without the tools furnished by the thought of their predecessors. Before Newton there were in England two men of very different types of mind, without whom the exploration of the secrets of matter would have been immensely more difficult, perhaps immeasurably delayed. One was William Gilbert (1540-1603), who was physician to Queen Elizabeth, but who

has the far higher distinction of being known as the Father of Electrical Science. It was Gilbert who first showed that the whole Earth is a magnet ; and who appreciated the nature of electricity—to which, indeed, he gave its name.

Gilbert was no mathematician, and Galileo (almost the only man of science in the sixteenth century great enough to perceive the value of his work) regretted it. But John Napier of Merchiston, born in 1550, devoted to mathematics the time he could spare from religious controversies, and gave to the world that discovery of logarithms which simplified and extended the work of every exact explorer of matter who followed him, from Newton onwards. Next to Newton's own book of principles, the *Principia*, Napier's volume expounding his logarithms, is the most important work that has ever been published in the history of the exact sciences.

John Napier was of an old Scottish family which had provided three Provosts of Edinburgh and a Master of the Mint, but never a mathematician ; so that John, born at Merchiston Castle in 1550 and afterwards sent to the University of St. Andrews, was perhaps the greatest prodigy that ancient seat of learning ever fostered. His mathematics, though they

EXPLORERS · INVENTORS · WRITERS · ARTISTS · SCIENTISTS

have been indispensable to millions of calculators since his day, were something of a recreation to him, for it was only in the time he could spare from politics, and from the religious controversies which shook the Church of Scotland, that he studied them. A book he wrote on the Revelation of St. John seemed to him of much greater importance. His logarithms are a landmark in the history of science, but he would have been a fine mathematician even without them, as others of his books show

HOW NEWTON CAME IN TIME TO CARRY ON THE TORCH

Gilbert died in 1603 and Napier in 1617, and in the fourteen years between their deaths Galileo was doing his greatest work, and Kepler was examining the orbits of the planets. They passed away, Galileo an old and broken man when Newton was born to carry on the torch they had lighted.

The world was waiting for Sir Isaac Newton and he did not disappoint it. In the years of his life, from 1642 to 1727, he framed the laws of motion which ever since then have been the foundation of all that is known and observed about the movements of matter, or, as we should more exactly say, of material bodies; he found the laws which govern the action of gravity and which explain alike how an apple falls to the ground and how the Earth and her sister planets spin round the Sun. All the science of dynamics rests on Newton's Laws of Motion, which were founded not on mere speculations but on the exact measuring of motion. Perhaps how much depended on this exactness may be shown from one example in his researches.

PAVING THE WAY FOR THE GREAT SCIENTISTS TO COME

He had calculated that the Moon revolved about the Earth obedient to the Law of Gravitation; and he had shown how the period of the Moon's revolution, which was known and could be measured, depended on the size and weight of the Earth. But he delayed the publication of his results for ten years *because there was an error he could not account for*. Someone, not himself, had measured the circumference of the Earth wrongly. When that measurement was righted by the Frenchman Picard the calculations of Newton were found also to be right; and then he published them.

Newton laid down the laws of the way in which all matter moves, whether it is a particle or a planet. He had his own ideas about particles, or corpuscles as he would

have called them, and in his armchair at Cambridge, where in his old age he would sit and ponder, he may have anticipated the explanations of the structure of matter and its particles, which it was to be the next great task of science to find out. The truth was not only hidden beneath a mass of supposition but was also shut off by an inquiry which was following the wrong scent. The scientific men who were to follow Newton's great method of measurement, and apply it to particles of matter, were unborn. The wrong scent which the eighteenth century explorers of matter were following was known as the doctrine of *phlogiston*, according to which all bodies that burned contained an invisible substance. It was this substance called phlogiston which showed itself in the flame. Phlogiston was an unconscionably long time a-dying. Lavoisier, the French chemist, who lived from 1743 to 1794, killed it because, like Newton, he was a great measurer.

THE TRIALS AND TRIBULATIONS THAT BEFEL A GREAT MAN

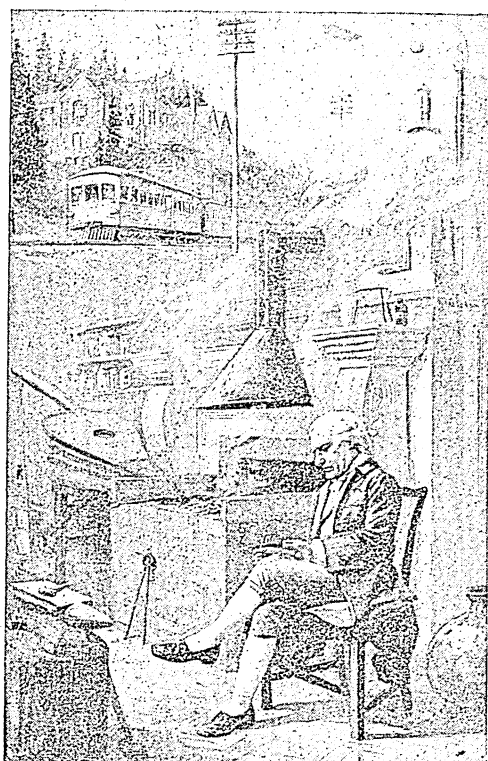
Young Lavoisier came of one of those rising families of the French middle class which, amid the poverty and misery of the lower classes in France in the century preceding the French Revolution, were making their way upward. His father was a lawyer, but young Lavoisier had a scientific bent which nothing could suppress, and when he was appointed to a kind of semi-official post in what we should call the Inland Revenue, he thought of his salary as only a means of furnishing his laboratory. But the collectors of taxes were hated through France, and when the Revolution came Lavoisier was a victim to the fury with which the revolutionists revenged themselves on a hated class, though there is every reason to believe that he was as honest and upright an official as he was an unsurpassed chemist. He did his best to help the peasants and relieve them of unjust burdens.

But the revolution in France, like the Russian Revolution of our own time, not only destroyed officialdom, but attacked even scientific men and suppressed learned societies, so that Lavoisier was doubly hated, both as a tax collector and as one of the heads of the famous Academy of Sciences. The Academy had rejected some scientific theories of Marat, the Republican leader, and Marat hated it accordingly. There were other enemies

FOUR EXPLORERS OF MATTER



SIR WILLIAM CROOKES WITH HIS
WONDERFUL TUBE IN ACTION



HENRY CAVENDISH SITS DREAMING
OF THE DAYS TO BE



PROFESSOR RÖNTGEN FINDS THE X-RAYS



MADAME CURIE IN HER LABORATORY

of Lavoisier, and they managed, in spite of every protest, to bring him before the revolutionary tribunal. The charges against him were false, and when his great scientific achievements were urged, the judge, Coffinhal, said that the Republic had no need of chemists. So, a few hours after this mockery of a trial, he went to the guillotine, and one of the wisest heads in France fell beneath the knife.

LAVOISIER'S DISCOVERY ON BURNING A BIT OF MATTER

Lavoisier showed that when a bit of matter was burned it weighed just as much afterwards as before, if the chemist was careful to burn it and weigh it in such a way as to preserve all the smoke and ashes of the bonfire, or as we should say, all the products of combustion.

A simple way of showing it would be to burn a bit of phosphorus in a closed jar, and weigh the jar and the phosphorus before and after. If the weight was exactly the same then there could be no phlogiston. Lavoisier not only showed that phlogiston was a useless and unnecessary ghost, but he laid down the great law that, whatever is done to matter, even burning it, *matter cannot be destroyed*. That is the law of the conservation of matter, on which all chemistry is founded.

But the English chemists of Lavoisier's century fought his simple truths. Even Joseph Priestley still stuck to phlogiston. He lived from 1733 to 1804 and discovered oxygen, which because it unites with a substance when it burns is an aid to the proof of Lavoisier's explanation. So did the greater Henry Cavendish, who thought hydrogen was phlogiston. Cavendish's obstinacy was even more strange than that of Priestley, for he was the first to explore the nature of water, and to show that it consisted of oxygen and hydrogen. When such a great man as Cavendish could be so prejudiced it was little wonder that the truth about the nature of matter made very little progress during the eighteenth century.

HENRY CAVENDISH, THE MAN WHO FIRST WEIGHED THE EARTH

Henry Cavendish, whose valuable life covered the period from 1731 to 1810, was indeed a great man, and a very odd one. He was one of the Cavendish family who are Dukes of Devonshire, and he became one of the richest men in England; but he lived and died alone among the instruments in his laboratory, seeing scarcely

anyone except a few scientific men, and giving instructions that the women servants were to keep out of his sight under pain of dismissal.

He hardly troubled to make known the results of his experiments, many of which were made on gases, but were only known after his death. He found, though he did not know it, that strange gas, now called argon, by the name given to it by its later discoverer, Lord Rayleigh, more than a century after. Cavendish anticipated many later discoveries on heat and electricity, and he was the first man to weigh the Earth. No more delicate measurement has ever been carried out than that of Henry Cavendish with his leaden balls and twisting balances; and the figures of 5.48 which he gave for the density of the Earth differ hardly at all from those of 5.52 which the most modern instruments and researches have arrived at.

Priestley's discovery of oxygen, which was almost the last contribution he made to the study of matter, helped to dig the grave of phlogiston. Perhaps, if he had been allowed to stay longer in England, he would have better perceived the truth, but he was a man of strong opinions on all matters, including politics; and because he expressed himself so freely on such matters as England's ill-treatment of the American colonists he was forced to emigrate to America.

THE CLEVER QUAKER BOY WHO TAUGHT HIS SCHOOLBOY FRIENDS

His work remained, for the study of gases was in all men's minds, and it occupied the thoughts of the chemist who was the first to give reality to the old fancy about the atom.

This was John Dalton, who lived from 1766 to 1844. His name is always coupled with the Atomic Theory. He was the son of a poor Cumberland weaver, and at 12 he began to teach other boys at the Quaker school in Eaglesfield where he had himself been taught. It was not a success, and he tried to earn his living as a farmer. That did not satisfy him either, and at last he found his true vocation, when he was a man of 27, as a teacher of mathematics and natural philosophy in Manchester. First of all he was interested in the science of weather, and that led him to the study of the air, and later to the study of gases.

Dalton's mind and method were as different as could be from those of Newton.

THE EXPLORERS OF MATTER

While Newton first measured things and then built up his conclusions from the measurements, Dalton went the other way about. He framed a theory which he thought was right and then used the measurements to show that it was right. One consequence was that some of his results were afterwards shown to be far from accurate, but that must not be allowed to take away from the enormous value of his Atomic Theory, which served for many, many years as a tool with which to get at the truth about the structure of matter, the nature of atoms, and the way in which they combine with one another.

His great idea was that the universe was made up of a number of elementary substances called elements, each of which, in its turn, was made up of a number of particles, or atoms, of one kind. This atom was peculiar to its own element, was different from the atom of any other element, and could by no means be split up into a smaller particle. There were, therefore, just as many kinds of atoms as there were elements, no more, no less. The atoms of any one element were all precisely alike, and had the same weight.

THE GREAT HELP THAT IMAGINATION CAN GIVE TO KNOWLEDGE

When atoms of different elements united they formed compound atoms, now called molecules, and these were the particles of compound bodies. These molecules, or compounded atoms, were also all alike and of the same weight. Dalton's figures, when he began to estimate the weights of atoms or of molecules, were often faulty; but his theory was sound, and when we look at the difference between the extent of the knowledge of the elements then and now, and the crude methods he had to work with, we can see what a wonderful help to knowledge the right kind of imagination can be. In Dalton's time there were only 23 elements known; by the middle of the nineteenth century there were 60; today there are 92.

Many great chemists followed Dalton in the nineteenth century, some of them with greater knowledge and more exact ways of thinking, but none laid a more enduring foundation than this simple Quaker who would have been unlearned had he not taught himself. Gay Lussac, the French chemist who lived from 1778 to 1850, and founded the laws concerning the uniting of gases was one; another was Berzelius (1779-1848) the great Swede who hardly

ever left off working till the day of his death and did much of the accurate research into the weights of atoms and molecules which Dalton had left undone; another was Avogadro (1776-1856), who framed the law known as Avogadro's Law, which establishes the fact that equal volumes of all gases, when under the same pressure and at the same temperature, contain the same number of molecules. It is a law Dalton had been in sight of, but had just missed. Then there was the Italian chemist Canizzaro (1826-1910) who linked Dalton with our own time, and who, besides putting the atomic weights in order, showed clearly the differences between atoms and molecules. He was the first architect of the molecule to tell how it was built up of the atomic bricks.

HOW LIEBIG EXTENDED THE STUDY OF ATOMS FROM DEAD TO LIVING MATTER

There were other chemists bound in the brotherhood of the science, but digging out the truth about the atoms and molecules of matter in different ways and with different tools. There was Liebig, the famous man, born 1803, who lived for 70 years and extended the study of atoms and molecules from dead to living matter; and who, besides being one of the greatest teachers of his time, founded the new science of organic chemistry, which is the chemistry of the substances containing the carbon formed in all living things. There was also Jean Baptiste Dumas, who in the first years of the nineteenth century began as an apprentice to an apothecary in the little French town of Alais, and rose, before he died in 1884, to be the first chemist in France, and to give to the world a knowledge of the compounds of carbon second only to that of Liebig. He was one of the pioneers in the classification of the elements into families.

THE GREAT GIFT OF AN ERRAND BOY TO THE WORLD

While the chemists were pushing their probes into matter from this point of view, another school had found a new implement of inquiry, the immensely powerful tool of electricity. Sir Humphry Davy first brought electricity to the service of chemistry, and his humble assistant, Faraday, the son of a Westmorland blacksmith and himself an errand-boy, gave to the world the mighty science of electricity in industry, which now lights our homes and runs our trains, and in fact has put a new force into the hands of men.

We have read their stories elsewhere ; here we need only consider what Faraday did to reveal the nature of matter.

He found that when atoms and molecules of different elements, of oxygen and of hydrogen, of carbon or iron or nitrogen, were built up into compounds, and built up so firmly that it seemed as if nothing would burst them asunder, electricity would rend them apart. He discovered how and why. Thus he framed the laws of *decomposition by electricity*, which he named electrolysis. Those laws, still good, brought those who worked them out to the wonderland where force and matter meet ; and where electric atoms, or electric *ions*, became a part of the atom of matter.

Thus Faraday links the eighteenth and nineteenth century explorers of the dark mysteries of matter with those who carry on the torch today. There is, as we all know, a kind of race which is called a relay race, and in which at the end of each stage the runner hands on the staff to another runner who carries on. The staff in the relay race passed through the hands of William Thomson, afterwards the famous Lord Kelvin, through the hands of James Prescott Joule, of James Clerk Maxwell, of Becquerel and Röntgen and the Curies, who went along the lighted track of radium ; and of Sir Joseph Thomson, Sir William Crookes, Lord Rayleigh, Sir William Ramsay, and Sir Ernest Rutherford—all of whom strove or are striving to cross the boundary where matter ceases to be matter and becomes electricity.

RECRUITS FROM MANY NATIONS FOR THE ARMY IN SEARCH OF KNOWLEDGE

They are pioneers of an army of peaceful penetration whose recruits are found in every country—Niels Bohr in Denmark, Planck in Germany, Millikan in America. Their names and work belong to the future rather than to the past, and those who write about matter and electricity today cannot yet tell where their names will be in the family tree of science. But the giants of the past stand out tall and plain. Helmholtz in Germany and Lord Kelvin in Britain are two of them.

Hermann von Helmholtz (1821-1894) might almost be called a scientist's scientist, for his thought and his writings set other scientific men to work, cleared up their ideas, put theories on the right track, and established them on a new foundation.

Lavoisier showed that matter can never be destroyed ; Helmholtz proved that force

must go on for ever ; by no means could force ever be destroyed. There were many other problems which the scientific world of the nineteenth century was threshing out, to which he gave the assistance of his powerful mind ; but we shall mention only two of them which bore on the exploration of matter. The first was the science of heat ; the second of light.

THE REVOLUTIONARY IDEAS OF A KEEN YOUNG SCIENTIST

Born in England, in 1818, three years before Helmholtz was born in Germany, John Prescott Joule had the insight to perceive that electro-magnetism would some day drive machines, and he worked out the laws by which force is converted into heat, or heat into force. Soaring far above the old superstition of phlogiston, he discerned the fact that heat was a kind of motion.

The life of Joule is an illustration of the power of hammering at the truth even when the listeners turn away their heads. When he was only ten years old he was sent by his father to study chemistry under Dalton in Manchester. His own bent was towards electricity and physics ; and when only 22 he sent a paper to the Royal Society. The Royal Society published an abstract of it, but no more, and his next paper was even more neglected, for it was not printed at all. That was in 1844, and the young scientist from Manchester was at that time thought to be somebody who was rather a crank with his new theories about heat and work. The turning point came in 1847, when the British Association met at Oxford, and Joule read a paper describing his experiments. The paper was about to be passed in the usual way, when a young man got up to ask some questions about it. This young man was William Thomson, afterwards Lord Kelvin, who even then was a considerable figure in the scientific world. Thomson followed Joule out of the lecture theatre and questioned him, and that moment was the beginning of the recognition of the value of Joule's work, and of a life-long friendship between the two distinguished men.

THE WISE MAN WHO BELIEVED HE HAD DONE "ONE OR TWO LITTLE THINGS"

Apart from the difficulty he had experienced in persuading the scientific world to recognise him, Joule's life ran smoothly. He never harboured resentment at his treatment, but used jokingly to say that the authorities of the Royal

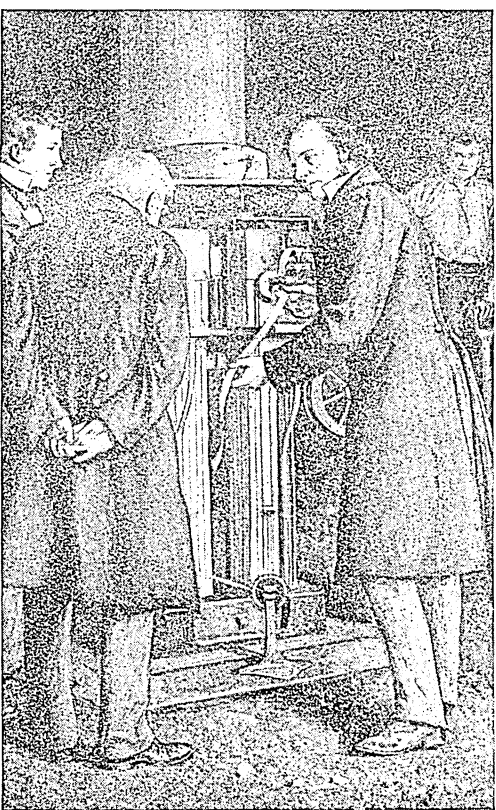
A GREAT BENEFACTOR OF THE WORLD



LORD KELVIN AT HOME IN HIS GARDEN



WORKING OUT IMPROVEMENTS ON HIS COMPASS



LORD KELVIN EXPLAINS AN INVENTION



TALKING THINGS OVER WITH HIS SISTER

Society in London could not be expected to believe that any good could come out of Manchester. His father, a brewer, allowed him an income to go on with his scientific work, and he never had much to do with the brewery, though many of his notes were made on the blank pages of the firm's stocktaking books. After his father's death he lost a good deal of his money, but a State pension kept anxiety away. Two years before he died he said, "I believe I have done two or three little things, but nothing to make a fuss about."

THE COLDEST COLD THAT COULD BE REACHED

From the work of these men sprang the new science of thermo-dynamics, which, as its name implies, investigates the links between heat and force, and therefore in the end between heat and matter. One by-path of this science enabled Lord Kelvin to say what was the coldest cold that could be reached. He placed it at 273 Centigrade degrees below the melting point of ice, or about 459 Fahrenheit degrees below freezing; and he called this new temperature at which every known form of matter, liquid or gas, would freeze solid, Absolute Zero. Long afterwards, Sir James Dewar, in solidifying hydrogen gas got to within 4 or 5 degrees of this temperature, and Dr. Kamerlingh Onnes, at Leyden, went a degree or two lower still when solidifying helium gas, and Absolute Zero has now been nearly reached.

Lord Kelvin was one of the deepest thinkers and the greatest inventors of the nineteenth century.

Many thought of him as one of those mysterious scientific men always busied with abstract problems of mathematics and physics. If we tried to measure his intellect we should find that true, for it moved on mountain heights of knowledge where only the choicest minds of his day could accompany him. But his was also one of those wonderful and simple minds which could descend to the needs and realities of daily life.

THE AMAZING GENIUS WHO MADE THE ATLANTIC CABLE WORK

His was the two-sided genius which could wrestle with all the manifold perplexities of one of Nature's secret workings, and, having solved them, make use of the results. It was he, in the days when he was plain William Thomson, who first made possible communication between the Old World and the New.

The great Atlantic cable had been laid, but when the engineers strove to send words across it they filled it so full of electricity that practically it burst. William Thomson showed them how to make it work. But he would not have known how or why if it had not been for his many years' study of the mathematics of negative electricity.

Nowadays men speak across the Atlantic without cables, but how many years more might we not have had to wait for this daily miracle had it not been for a paper on electric oscillations which Lord Kelvin wrote in 1853? It laid the foundation for the methods of oscillatory discharges employed half a century afterwards in the first wireless signals.

These were his great works of inventiveness, but there are plenty of others. Nearly every time we turn on a tap we owe something to him, for nearly all taps are Kelvin taps, which he devised to shut off leakages. When the sexcentenary of his old college at Cambridge, Peterhouse, was held he was the most honoured guest, and some of the undergraduates hit on a little joke for the occasion. One by one, as they came up to be introduced to him, they solemnly congratulated him on his famous invention of a beer-tap, as if that had been the summit of his career. Lord Kelvin saw the joke; his kindly yet most venerable face became suffused with a smile.

LORD KELVIN AND THE IMMENSE RANGE OF HIS LABOURS

A beautiful and almost childlike simplicity went with that mind and face of benevolent omniscience. He had the greatest and most profound knowledge of his time in mathematical physics, in electricity, in magnetism. His mind took in the structure of matter, the mechanics of the spinning planets, the meanings of energy; and yet it could occupy itself with the inventions of taps, or the mariner's compass, electric glow lamps, safety fuses, clocks and balances, or a hundred of such odd and useful things.

Yet the greatest of all things about Lord Kelvin was his simple goodness. Thackeray, who was alive when William Thomson was a fair-haired youth, met him and was delighted with him. He said he was an angel, and must have wings under his flannel waistcoat; and one of those who most often fought intellectual battles with him wrote, after

THE EXPLORERS OF MATTER

taking part in one of these friendly discussions, that, as was said of Lancelot,

Gentler knight .

There never broke a lance.

While Joule and Helmholtz and Lord Kelvin were young men, James Clerk Maxwell was born, in 1831. He grew up a dreamy lad, and always had delicate

netism and light, to which all who think and work on those mysteries must turn.

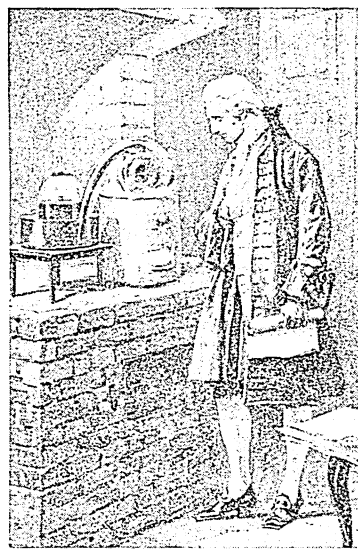
His was the mind, as we read on another page, which perceived that light was an electro-magnetic wave; and it was he who predicted the waves that have become the basis of Wireless. Helmholtz in Germany saw the truth of Maxwell's writings and gave Professor Hertz the hint which



JOHN DALTON COLLECTING MARSH FIRE GAS—FROM THE PAINTING BY FORD MADOX BROWN IN MANCHESTER TOWN HALL



YOUNG CLERK MAXWELL ENTERS EDINBURGH ACADEMY



LAVOISIER IN HIS LABORATORY

health. But in him burned such an intellect that we wonder what he might not have done had he not died in the height of his powers at 48. But at Aberdeen, at London, and at Cambridge, he founded theories of the nature of electricity, of electric waves, and of the connection between electricity and mag-

netism and light, to which all who think and work on those mysteries must turn. first proved and showed that these waves existed. It was from Maxwell's beginnings that Helmholtz first worked out the notion of an electric atom or electron.

Lord Kelvin thought that matter was formed out of strains or whirlpools in the ether; and if this view has given place to others which connect force, or strain, or

motion, with the building up of matter, his ideas helped the others along.

Rather oddly, the idea of matter as a system of a number of forces which are all in motion, was divined by one who was neither an electrician nor a mathematician. This was Sir William Crookes, who was born in 1832 and lived into the days of the Great War. Forty years before his long and fruitful life work as a chemist came to an end in 1915, Sir William Crookes believed and said that there was a fourth state of matter, neither solid, liquid, nor gas, but something finer than any; and that in some circumstances we could see it. This fourth state of matter he believed was visible when electricity was sent discharging and charging through gases. The gases had to be very thin, so thin that the little bulbs where they were contained were practically like a vacuum. When electricity passed through these we saw, said Crookes, electric messengers smaller even than atoms.

THE WIDE FIELD OF RESEARCH COVERED BY SIR WILLIAM CROOKES

Sir William Crookes was an early riser in science, for his first paper on chemistry was written when he was a youth of 19; but throughout his long life he never ceased to work and produce new and fertile ideas. When he was over 70, he went to Kimberley to study the formation of diamonds, some small artificial specimens of which he actually made in a London lecture theatre; and though, as a chemist, he was mainly known as one who by patient endeavour had discovered new elements, his ventures into other fields of research and thought were productive of ideas which will make him longer remembered.

It was Crookes who first made the little radiometers to show the pressure of light, and though they were incomplete models of the process, they led him to the far more wonderful conception of a "fourth state of matter," neither solid, liquid, nor gaseous, but on the borderland where energy and matter meet. In his later life he first pointed out the enormous importance of obtaining nitrogen from the air to stimulate the world's food supply, and he was the inventor of a kind of tinted spectacles which have saved the eyes of thousands of people from strain and injury. His accurate work in chemistry, his ideas about the connection between force and matter, made him a practical scientist, but one who had far-seeing

thoughts about the unseen, and no one was a stronger believer than he in the unseen world.

After Crookes came Antoine Henri Becquerel, in France, with his new electric rays; Röntgen with the X-rays, and then the Curies, with the three kinds of ray that shoot out of radium.

THE POOR POLISH GIRL WHO WON WORLD-WIDE FAME IN PARIS

Madame Curie, who must be placed among those rare and fortunate few who bring into science an idea which gives to scientific work and thought an entirely new direction, was a poor Polish girl whose maiden name was Marie Skłodowska and whose first lessons in chemistry were learned at the Lycée in Warsaw. There she took her degree, and was fired with the desire to study in the ampler schools of Paris to which she made her way. As a struggling pupil she worked at the Sorbonne, where her industry and talent became recognised. She studied, as others did, the radio-active minerals then beginning to excite attention, but from them she drew more than any one else had done, for she brought forth the strange and wonderful metal radium.

The essay she wrote when she took her degree as Doctor of Science in 1903 has become historic. She married a professor of the Sorbonne, M. Pierre Curie, and the two worked together; but to Madame Curie belongs the credit of having separated the veritable radium from the common mineral pitchblende. First she found what appeared to be two radium-like elements, and she named one of them polonium, after her native land of Poland. But radium, which she afterwards separated, finding its atomic weight and giving to it its right place among the elements, was a discovery for all time. All the world came to know of her; she was elected a professor at the Sorbonne, and was invited to America, where, in honour of her achievement, she was presented with a gramme of the precious metal she had been first to make known.

THE IDEA THAT ALL MATTER IS MADE UP OF ELECTRICITY

From the examination of all these rays, not by one man but by scores of eager students who follow in the paths laid down by others, has come the belief, amounting almost to a conviction, that the atoms of matter are made up of the smaller atoms of electricity, or electrons.

The Great Stories of the World That Will Be Told for Ever



THREE JAPANESE MIRRORS

HERE are three stories about Japanese mirrors, but before we read them we must understand why such strange legends are believed.

Why do the Japanese think that mirrors have souls? They believe that from constantly reflecting the owner's face the mirror takes to itself something of her spirit. In the same way they treat old dolls with reverence, believing that from being loved by generations of children they grow to have a soul; so these family dolls, sometimes a hundred years old, are never thrown away or burned. Dead flowers, also, are placed in running water, not flung into the dust.

Once upon a time the priests of a certain temple greatly desired to have a bell for it. But everyone was too poor to give money, and so the priests begged that women would give their mirrors to be melted down—Japanese mirrors are made of polished metal, with a rounded surface, and are not of glass like ours.

Soon a corner of the temple courtyard was heaped with offerings, and they stood for real sacrifice. Every time a certain farmer's wife went to pray she saw them and thought that she ought to bring her own, but for a long time she could not part with it. At last she brought the treasure, laid it on the pile, and hastened

away with such an angry heart that she could not go into the temple to pray. She grudged the gift, and could almost have snatched it back if the courtyard had been empty.

Now every time she went to the temple she saw her mirror lying on the heap, no longer polished and cared for. She thought how it had reflected the joys and sorrows of her grandmother and her mother, the grimaces and laughter of children, the wedding tite of brides. Surely a part of her own soul lay in the bronze mirror with the design of willow, bamboo, and plum flower on its back! Her heart became more and more bitter.

By this time there were enough of the precious little gifts to make a bell, and they were thrown into the melting-pot. But the workmen reported a miracle to the priests. One of the mirrors would not melt!

"The owner of that mirror grudges her gift," said the priest.

Soon the whole village was tattling about the mirror with the design of willow, bamboo, and plum which refused to be part of the bell, and someone remembered that it had been the offering of the farmer's wife.

The woman's heart was moved, not to shame, but to more bitterness. She wished to be revenged, even at the cost of her

IMAGINATION · CHIVALRY · LEGENDS · GOLDEN DEEDS · FAIRY TALES

life. One morning a message was found pinned to her wooden pillow.

"I have drowned myself," it said, "because I could not endure your taunts. Now you will be able to melt my poor mirror and make your bell. But my ghost will return, and if any man rings the bell hard enough to crack it I will be his guardian and bring him to great fortune."

The woman's body was found in a stream, and the mirror melted into the rest of the metal.

In due time the bell was hung, and, as everyone knew of the woman's promise, men were always ringing it. In vain did the priests forbid it. Day or night, by hook or by crook, the clangour went on till the village was nearly distracted. At last the bell had to be taken down, and so the spiteful woman got her revenge.

The story of Matsumura is a happier mirror story, though, in truth, it begins badly enough.

There was a certain house in Kyoto which had an evil reputation because two of its former owners had drowned themselves in the well that stood in the courtyard. So it was let very cheaply to Matsumura, a poor priest, who had come to the city to try to get a grant from the Regent for the restoration of his temple.

There was a drought in the district at that time, and Matsumura's was one of the few wells that did not go dry, so that many people got leave from him to use it. One day there was an outcry in the courtyard. A young man had been found drowned in the well. Then, for the first time, Matsumura heard all the queer stories about it.

He leaned on the brink for a long time, quite alone, turning the matter over in his mind. All at once he started, for something white appeared in the dark water below. It reached the surface, and was revealed as the face of a beautiful woman. She smiled wistfully up at the priest.

Matsumura felt his knees melt with fright. He hardly had strength to run from the well. As soon as he had recovered a little he called some men to help him, and covered the well over, weighing down the lid with great stones and logs so that no one else might fall a victim to the demon beneath.

That night a knock came at Matsumura's door. He opened it, and saw the maid of the well standing in the moonlight. In spite of his terror the priest cried "Fiend,

what do you want? Why have you drawn people to death? I will call the good spirit to drive you away."

But the maiden interrupted him, saying, "I am no fiend. I desired not men's death, but their help. The water is low. Search for my body, and then at last I shall be at rest."

So saying she walked across the courtyard and melted into the well like a wisp of smoke, in spite of its cover.

Matsumura spent a troubled night, and early next morning he told his story to neighbours, who were willing enough to help him explore its mysteries. However, all they could find was a mirror, black and slimy from the water.

Matsumura did not scoff at the discovery, like the others. He carefully cleaned it, and found it to be of silver, with inscriptions on the back which he could not read save for a few scattered dates and names. Therefore he wrapped the mirror in a cloth, and waited for the maiden, who, he felt sure, would return.

Sure enough, one evening he raised his eyes from his holy book to see her standing before him again.

"Priest," she said, "I thank you for your rescue and care of me. I am the soul of the mirror. I belonged in ancient times to Lady Kamo of the Imperial Court, and have been an heirloom in her family for many years. At last someone, in a fit of spite, threw me into that well. After reflecting so much beauty and gladness, sunlight and colour, I lay in the darkness, far from human touch. I was wretched; I longed to escape. O, priest, give me to Lord Yoshimasa, the descendant of my first mistress, and I shall be happy again."

So saying she vanished.

Now Lord Yoshimasa was the Regent of the province, with whom Matsumura had long sought an audience. The priest set out with the mirror next day, and said that he wished to restore an heirloom to the Regent. He was brought into his presence, and Yoshimasa was so pleased by the story that he readily granted money for the restoration of the temple. As for the mirror, she was happy in the hands of Yoshimasa's little daughter, who had just put up her hair.

The last of the mirror stories, and the prettiest, is not supernatural at all.

In ancient days there lived in a district far from any town a man and his wife

THREE JAPANESE MIRRORS

who had one adored child called Matsuyama. One day the man had to take a journey to a distant city. His wife and daughter were very wretched at his going, and when he promised to bring them back beautiful presents they replied, "Only bring yourself home!"

They thought of nothing but robbers and demons and floods until the joyful day when his large hat came slowly up the road again. How they welcomed him! How they pulled him in, dusty sandals and all, quite contrary to Japanese custom! How they bombarded him with questions and news!

But the man would not answer a question till he had opened his bamboo box and put into Matsuyama's arms a doll as big as a child a year old. Her delight was so great that she took no interest in her mother's present, a mirror.

"Whose picture have you brought me?" asked the wife, and her husband had to explain this wonderful new thing.

Some time after this the mother sickened and died. Little Matsuyama was alone with her just before she drew her last breath. She begged the child to take care of her father, gave her several instructions about the house, and, taking from under the mattress something wrapped in cloth, gave it to her daughter as her greatest treasure.

For a long time the little girl was too miserable even to remember the little package which lay in the coffer where she kept her toys and dresses. Before long the man married again, because he felt that his daughter needed a woman's

care. But the new wife was jealous of the petted child, and was unkind to her.

One day the lonely child came upon the package, and opened it. To her astonishment she saw what she thought to be her mother's face looking at her; but it was younger, and full of health. Her joy at seeing it made the reflection smile.

"Oh," thought Matsuyama, "my mother's spirit has returned to me. I shall never mind anything else again."

Soon the stepmother noticed that the child was always crouching over something in corners. She came to the conclusion that the child hated her, and had made an image into which she stuck pins so as to bring about the stepmother's death by witchcraft. She told the father, who laughed at the idea of Matsuyama's murderous plot as ridiculous, and went in search of the child.

He found her bent over something in a corner of the garden. To his astonishment, she slipped some object into her sleeve, and flushed at the sound of his step. Very sternly he asked what she was hiding, and as he had never spoken severely to her before Matsuyama stammered and wept. Her father feared that after all she was guilty of the silly wickedness her stepmother accused her of. He took her by the arm, down fell the mirror, and out burst Matsuyama's story in a flood of tears.

When the father told his wife her heart was touched. She sought the child's forgiveness; it was readily given, and peace returned to a home where Matsuyama was once more loved and loving.

BIDDY AND THE CANDLE

MORE than two hundred years ago Lady Edgeworth lived at a place called Castle Lissard.

Even in those days there was much disturbance in Ireland and little law; and though there were guests staying at Castle Lissard they knew that the house might be attacked, so that a barrel of gunpowder was kept in a loft.

One evening there was an alarm. The men got their guns, and Lady Edgeworth hurried up to the loft to bring down some powder, for in those days there were no cartridges, but the powder was dropped into the barrel of the musket and the bullet rammed down with a ramrod. She took with her a young servant to carry a tallow candle, which had no candlestick.

But Biddy, the maid, knew nothing about gunpowder, and when Lady Edgeworth was half-way downstairs again there was Biddy coming behind her with no candle.

"Biddy," said Lady Edgeworth, "where's the candle?"

"Sure, and I left it," said Biddy, "sticking in the barrel of black salt."

Now, if a spark from that candle reached the "black salt" half the house would be blown down, and many lives lost. Straight into the danger sped Lady Edgeworth. She darted upstairs to the spluttering and flaring candle, lifted it with firm fingers, and carried it away.

It is good to know that she lived to be ninety years old and was one of the ancestors of Maria Edgeworth.

COMMENT MAÎTRE LAPIN FIT FORTUNE

This is a French translation of the story told in English on page 3989

C'EST une grave erreur de traiter les montagnes avec insouciance. Certaines sont très coléreuses, et deviennent parfois tout à fait rageuses. Il y en avait une appelée Pahe Wathahuni, qui était cannibale !

Souvent, par la pluie battante, ou sous le soleil torride, un voyageur se réfugiait dans une caverne ombreuse. Alors, *clic !* elle se refermait derrière lui ! C'était la gueule de Pahe Wathahuni.

Cet état de chose déplorable aurait pu durer jusqu'à présent sans Maître Lapin. Ce dernier désirait fort être admiré, célèbre comme les grands Chefs des Sioux. Il cherchait à faire une action d'éclat. Quoi de plus fort que de vaincre la montagne ?

Un jour que sa grand'mère le croyait à la chasse aux pissenlits, Maître Lapin gravit la montagne, et se mit à danser dessus en criant : " Mange-moi, mange-moi donc, Pahe Wathahuni ! "

Mais la montagne ne mangeait que des Peaux-Rouges pour son dîner, et elle ne voulait pas ouvrir la gueule pour dévorer un animal si minuscule. Cela n'en valait pas la peine.

Maître Lapin dut guetter, attendre jusqu'à ce que, un beau jour, des étrangers ignorants vinssent à traverser ces hauteurs dangereuses. Soudain une cavité

énorme s'ouvrit sous leurs pieds, et ils furent engouffrés. Maître Lapin réussit à se glisser dedans, lui aussi.

Dans le ventre de la montagne il faisait tout noir. A mesure que Maître Lapin grimpait de ci, de là, Pahe Wathahuni commençait à ressentir un certain malaise, non pas les angoisses du remords, mais les tourments que ressentent les passagers dans le Golfe de Gascogne. Bientôt Maître Lapin réussit à s'échapper de cet organe et à ramper parmi les côtes de la montagne, à la recherche d'une pulsation presque imperceptible.

Enfin il trouva ce qu'il cherchait : c'était le cœur de Pahe Wathahuni !

Maître Lapin commençait à défaillir, faute d'air, mais il rassembla toutes ses forces et plongea son couteau de chasse dans le cœur de la montagne !

Un beuglement formidable retentit, et, dans son agonie, la montagne se fendit en deux. Alors, tous les prisonniers qu'elle contenait furent libérés, et se mirent aussitôt à chanter les louanges de Maître Lapin.

Quand le calme régna de nouveau, on découvrit dans les ruines un monceau de trésors, qui échet à Maître Lapin, comme prix de sa victoire ; si bien que désormais il fut non seulement célèbre, comme il avait désiré l'être, mais aussi fabuleusement riche.

THE BOY WHO WAS AFRAID

THE combatants in a certain sector during the Great War knew that in a few minutes they would be launched into the reeking fire of death.

The lieutenant who had to lead the men was a son of a peaceful parsonage, a man with quiet, kindly ways, but of lion-like courage. He knew that there was not a man in his company who would not die with him at the appointed time. There was a perfect understanding between this parson's son and the rough, tear-away heroes he commanded.

The long-expected summons came. The lieutenant gave the word to charge, but one of his young men, a stalwart, cheery-hearted fellow, reeled as the fateful word was spoken. His face became ashy pale, and his powerful young frame trembled visibly. Was one of this glorious little company failing at the final moment ?

The young soldier turned towards his officer, and the two men looked straight

into one another's eyes. Neither spoke. After a moment the stalwart young private sprang to his officer and stretched out his hand. Officer and man exchanged one tremendous hand-grip, still without a word. Then the company roared a hurrah, and shot out of the trench and over the parapet like schoolboys playing a game.

The first man to reach the open was the young man who had quailed. He was first into the storm of bullets and shrapnel, the first to come to grips with the enemy. The second was his officer.

Within five minutes of the order to charge the officer and private were struck down together. They fell side by side, and the last glance of the youngster was fixed on the face of the officer whose courage had inspired him in the one tragic moment of his fear. " The bravest man I ever knew," says that officer, " was this lad who felt a great fear, mastered it, and charged home like a Crusader. "

A PAIR OF OLD BOOTS

A LITTLE servant, hard worked, ill-paid, but kindly treated, asked her mistress one morning if she might have the master's old pair of boots.

The mistress laughed.

"Why, Mary," she said, "you could never wear such old boots as those; they are worn to the soles."

The maid smiled at her mistress.

"I wasn't thinking of keeping them for myself, m'm," she answered; "I was thinking of giving them away to a friend."

The boots were given. The maid wrapped them up in brown paper, fastened the packet with string, and addressed it. She took a long time writing the address, working her tongue with the movements of the pen, and stopping every now and then to be quite sure about the spelling of the words.

"It's a long time since I wrote," she said. "I'm ashamed to say I've almost forgotten how to spell properly."

Her mistress, looking over her shoulder, saw that the packet was addressed to the Barefoot Mission of the Shaftesbury Society.

"It was just such a pair of boots as this," said the little

maid, laying down her pen, "as saved me. I was at school one day, all in rags and tatters, when a parcel arrived, same as this one, and inside it was a lovely pair of gentleman's old boots. The superintendent saw me looking at them. 'Mary,' he said, 'how would your father like a pair of nice boots?' 'Oh, not half!' I answered him. I was half laughing and half crying. 'Well,' says the superintendent, 'you take these home to him, and tell him, with my love, that many a man has walked to heaven in worse boots than these. Cast off they may be, but so are plenty of children in London, and plenty of those cast-off children find God for their Father.'

"He gave me the boots, and I ran home with them. If you had seen Father! He put 'em on; he walked up and down the room; he sat and crossed his legs; he looked at 'em, and said: 'Bread or no bread, I'll sport a penny to get 'em shined.' And he really did. He came back with them, and I said to him: 'You must mind, Father, what the superintendent said, won't you, now?' 'Mary,' he says, 'you've got no mother; you've acted as mother, washervoman, and handy-man to your little brothers and sisters, and like a mother-in-law to me. And now you've done something you never dreamed of doing. You've made a gentleman of your father, Mary. I intend

to live up to these boots.' And, do you know, m'm, they made *that* difference to him that he shaved himself every day, took more pride in his washing, and looked so nice and happy that he got a regular job, and kept it for over four months. We was more happy then than ever we'd been before. We was always polishing up and hoping. We never was what we were before Father got the boots."

The mistress, interested in the story, asked what happened afterwards; but Mary did not care to speak about it.

"It wasn't quite so happy; but it was never, never what it was before," she said. "He pawned the boots, and then went right back again until I earned a shilling and got them out. It was like that, off and on, for years—him pawning and me getting them out—till he couldn't pawn them because they were so wore out. 'Oh, Mary,' he used to say, 'if I could only live up to them boots! I've tried, my girl. You know I've tried. And perhaps I'm better for having tried. We're all better for it. But, Mary, your father's got a weak heart—a weak heart, Mary;



"HE GAVE ME THE BOOTS, AND I RAN HOME"

that's the trouble. Ah, my girl, India kills hundreds of men!' He always spoke in that fashion. He was very kind. We were very fond of him, and none of us is likely to forget how Father tried to live up to the old boots."

The mistress saw the address on the package, and said she would save the postage by carrying it there herself. When she arrived at the school it was crowded with children, the poorest of the poor—children with famished faces, ragged, grubby, bootless some of them, and all thin, terribly, dreadfully thin. She told the story to the superintendent.

"I remember your little Mary perfectly," he said; "her father had been a soldier—a sergeant, I think—and the boots really did revive his ideas of self-respect. And now I will show you a still more wonderful thing."

The school closed. The superintendent kept three miserable children behind. "I want to go home with you," he said.

One of the children was a big girl. She whispered to the superintendent like one entranced, and glanced at the lady.

"Oh, it will be all right, dear!" he answered cheerfully.

As they walked through the streets he said to the lady: "These boots sent by Mary shall also go to a soldier."

They arrived in a court which was dark, ill-smelling, and grimy. In a small room they found a handsome-looking but tattered man addressing envelopes at a table, while his wife lay sprawled upon a ragged bed, drunk and asleep. The man greeted the superintendent rather roughly,

frowned on the lady, and then turned to the children with a certain masculine tenderness in his troubled eyes. "Have you enjoyed yourselves?" he demanded.

And they said "Yes," putting their arms round his neck.

The superintendent left the packet on the table without opening it, said that it came from the daughter of an old soldier, and withdrew.

"That man," he said to the lady, when they were outside the door, "commanded one of the best of our cavalry regiments. He has come to this through devotion to his wife. She has ruined him by drink. And he devotes himself to her, and strives to save her, because he says that he was the cause. At one time he was a drinker. Tell Mary that another old soldier has got her pair of boots."

The lady became so interested in this work that she sent all her old garments, and sometimes a few shillings—she was poor herself—to the Shaftesbury Society.

Mary soon got to know the Colonel, and on her afternoons out she would go to the dingy room and put it to rights.

She is now living in hopes that the Colonel's wife, who is lying at death's door in a hospital, will come back to a little room so bright and hopeful that she will try to live up to it.

"The thing is, m'm," Mary told her mistress, "to give everybody something they can live up to—even if it's a pair of old boots. It's like heaven. If you try to live up to heaven life is not so hard, and the grave isn't never so black and cold as it seemed to be before."

THE MAN WHO THOUGHT OF HIS COMRADES

DURING the construction of the railway between Manchester and Leeds, many years ago, a number of tunnels had to be bored. Shafts, some of them two hundred feet deep, were sunk from the hilltops to the tunnels for purposes of ventilation.

Among the men employed on this work was a navvy whose duty was at the top of the shafts. He had to raise the tubs filled underground, and return them empty to the other workmen. If any mishap occurred, such as the breaking of a chain or the falling of a piece of loose rock, he had to warn the men below.

One morning, while he was thus engaged at one of the deepest shafts on the line, his foot slipped, and he felt himself falling towards the narrow channel, against whose

ragged sides or on whose rocky bottom he knew he must be hurled and killed.

In that terrible moment, however, he did not lose his presence of mind. His first thought was of his comrades. If he cried out for help the men below would rush out of their shelters to see what was the matter, and even if they succeeded in saving him it would be at the tremendous risk of losing their own lives.

So the man, with a chivalry as great as that of any knight, gave in his usual voice the signal "Look out below!" And, secure in their retreats, ignorant of what was happening, the workmen below heard the crash as their comrade fell; and in his death, by suppressing the instinct to cry for help, he saved his fellow-workmen.

THE TWELVE LABOURS OF HERCULES

High in honour was Hercules among the heroes of the ancient Greeks, who chose him as the patron of strength. *The labours of Hercules* has become a well-known phrase, and some of the titles of the labours are often quoted today. "Cleansing the Augean stables," for instance, is another way of speaking of the clearing up of some nearly hopeless muddle. In his youth Hercules roused the jealousy of Eurystheus, King of Argolis, into whose power the gods placed him for twelve years of service. During these twelve years the king set Hercules the following twelve tasks, all of which he carried out.

THE SNAKE WITH A HUNDRED HEADS

THE hydra was a monstrous water-snake with a hundred heads, which grew again as fast as they were cut off. This fierce monster devastated Argolis, dragging men and beasts into the swamp where it lived, and strangling them.

Hercules was aided in killing it by his friend Iolaus, who applied a lighted fire-brand to the stumps immediately after Hercules had cut off the heads with his sword. They both dipped their arrows in its poisonous gall, so that the wounds they gave should be incurable.

SLAYING THE LION

ALION was terrifying the inhabitants of a district in Argolis, coming out of the forest from time to time and killing the inhabitants of the neighbouring villages. So powerful was the beast that none dared attack it, and no sword or arrow could pierce its skin; but Hercules seized the lion in his powerful arms and forced it on its back. Then he knelt upon it and strangled it with his hands. The hero removed its invulnerable skin, and wore it ever after round his own shoulders.

THE CAPTURE OF THE SACRED STAG

THERE lived on the Cerynceian Mountain a wonderful stag that was sacred to Diana, the goddess of hunting. Its horns were of pure gold, its hoofs were of brass, and it was so fleet of foot that no man had ever been able to catch it. Hercules was commanded to capture it and to bring it unhurt to Eurystheus. This he succeeded in doing after a full year's chase through the forests that in those days almost covered the south of Greece. As he was returning the wrathful Diana met him, but she was appeased when he told her his story.

CLEANSING THE STABLES

ONE of the labours of Hercules has given a proverb to the world, for when we wish to call a task almost impossible of accomplishment we speak of it as like cleansing the Augean stables.

Augeas was King of Elis, and owner of some 3000 head of cattle. The stables in which these cattle lived had never been

cleansed, and were in a most terrible state of filth, so that the task of cleaning them out in one day seemed impossible even for Hercules. Yet he easily effected it by breaking down part of the wall and diverting through the stables a river that flowed close by, thus washing out the horrible mire and filth within.

THE ARCADIAN BOAR

THE neighbouring State of Arcadia was being ruined by a huge boar which came down from Mount Erymanthus and spared neither man nor beast. Hercules was accordingly sent to capture the beast.

The boar had hitherto defied all the attacks and ruses of the Arcadian shepherd folk, but when the terrible monster saw Hercules it turned and fled up the snow-clad mountains, with Hercules in full chase. He succeeded in bringing it to Eurystheus, however, who was so terrified at the sight of it that he crept into a cask to hide.

THE BIRDS WITH THE BRAZEN WINGS

THE marshy forests around Lake Stymphalis, in Arcadia, were infested by some voracious birds, whose wings, talons, and heads were of brass. These birds fed on the flesh of men and animals.

When sent to slay them Hercules was puzzled how to get near them, so inaccessible was their nest. He therefore begged Minerva, the goddess of brave deeds, to help him, and she gave him a brazen rattle. Hercules stood on the shores of the lake and made the woods re-echo with a terrible din. The startled birds flew out into the open, and Hercules shot them with his poisoned arrows.

THE MAD BULL OF CRETE

MINOS, King of Crete, an island to the south of Greece, had once promised to sacrifice a huge bull to Neptune, the god of the sea. Because of its great size and beauty, however, Minos had kept it for himself. The bull went mad and began to destroy the crops of the island. Hercules captured it, and brought the raging beast alive to Mycenae as his seventh labour, but King Eurystheus foolishly let it loose, and it crossed the Isthmus of Corinth and ravaged the valley of Marathon, in Attica.

THE MAN-EATING HORSES

DIOMEDES, King of Thrace, was so cruel that he was wont to throw all strangers to wild horses, which devoured them. Hercules, with some of his brave friends, sailed to Thrace, attacked and captured the tyrant, and gave him to his own horses to eat. Hercules then brought the horses to Mycenae, and drove them up into the mountains, where they were torn to pieces by wild beasts.

THE GIRDLE OF THE AMAZON QUEEN

IN the ninth labour Hercules had also to make a long journey. This time he was sent to fetch the girdle of Hippolyte, the queen of the warlike Amazons, who dwelled in the land of Scythia.

Some say that he killed the queen after a hard fight, and others that he only captured her and gave her in marriage to his friend Theseus. At any rate, he brought the girdle back to Eurystheus.

THE BATTLE WITH THE GIANT

FAR away from Greece, in the unknown western sea, there was an island called Gades. Traders brought strange tidings thence of a three-bodied giant named Geryon, who owned beautiful herds of cattle and a two-headed dog to watch over them. Hercules was sent to fetch these cattle. Many are the tales told by the Greek poets about this journey: how, for instance, scorched by the heat, he tried to shoot the sun god, who, admiring his audacity, gave him a golden bowl, wherein he sailed to the island, passing through the Straits of Gibraltar. The rocks looking down on the straits were called the Pillars of Hercules.

The hero slew the giant's herdsmen and his two-headed dog, but just as he was driving off the cattle Geryon came up in hot haste and seized him. After a terrific struggle Geryon was defeated. Even then

all was not peaceful sailing homewards, for in Italy a fire-breathing giant called Cacus stole some of the herd, and hid them in a cave, dragging them backwards so that their tracks should deceive their owner. Hercules, however, heard the lowing of the cattle, squeezed Cacus to death, and set them free.

THE GOLDEN APPLES

IN a beautiful land in the west of Africa lived some nymphs called the Hesperides. It was their duty to guard the fruit which Mother Earth had presented to the goddess Juno as a bridal gift. A sleepless dragon guarded the plantation where grew the golden apples, and the way to it was full of difficulties.

After lengthy wanderings and terrible fights with giants and tyrants Hercules succeeded in catching Nereus, one of the gods of the sea, who changed into all kinds of shapes in his endeavours to escape from the strong hands that gripped him. Finding all his wiles of no avail, he resumed his natural shape, and sent Hercules to Atlas, who agreed to bring the fruit on condition that Hercules supported the heavens while he was away.

THE DOG OF THE UNDERWORLD

AT the entrance to Hades, the abode of the dead, there kept guard a three-headed dog named Cerberus, whose duty it was to prevent the living from entering and the dead from escaping out of the shadow-kingdom. Pluto, the dark-visaged King of the Underworld, gave Hercules permission to take the dog up into the light, provided he did not use weapons. This Hercules succeeded in doing, and he also led it back uninjured.

Hercules was then freed from his labours. He went about the world doing many noble deeds, and has ever since been honoured as the best type of physical strength.

A LITTLE BROWN-PAPER PARCEL

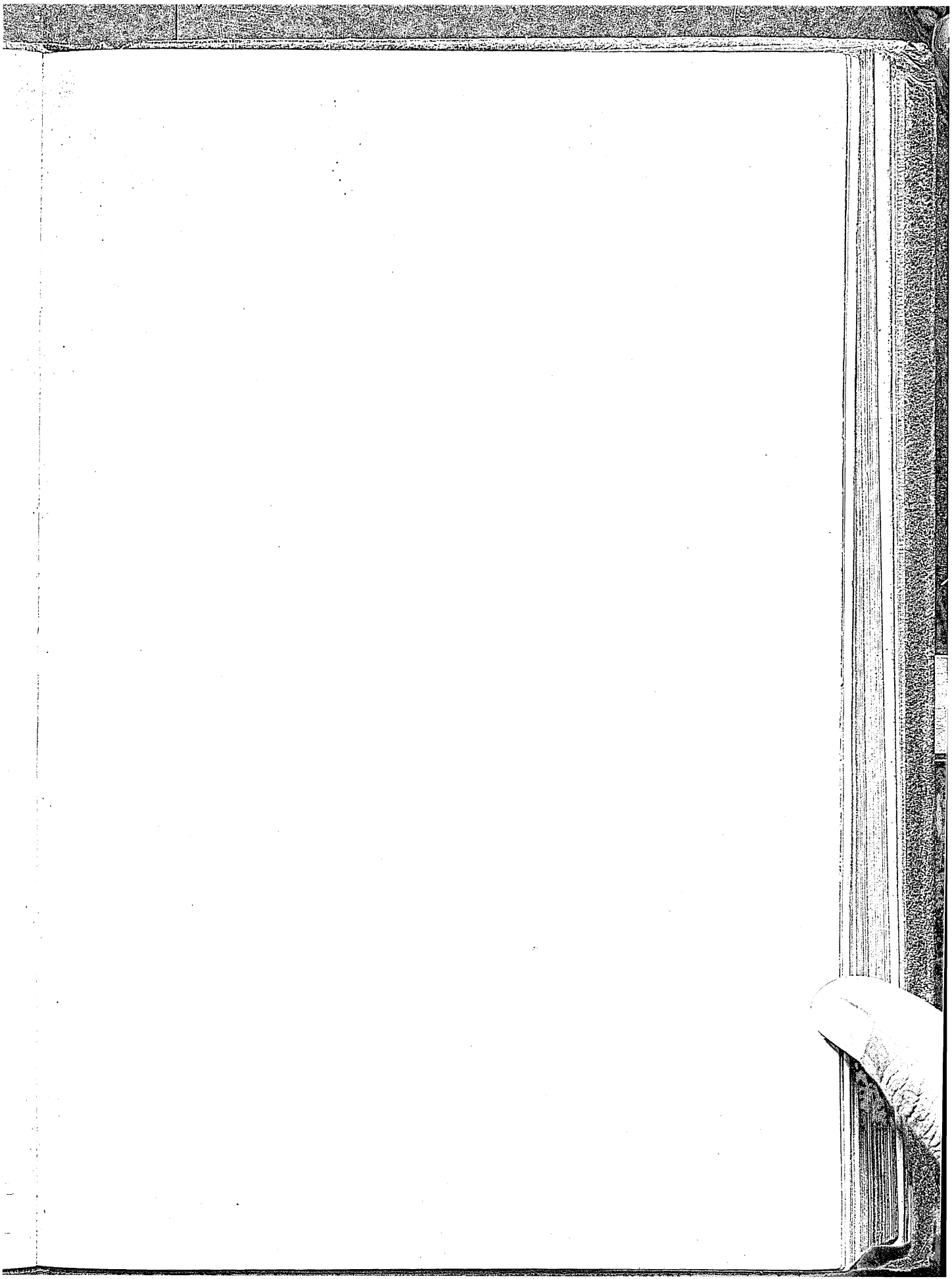
THE people at the London Hospital one day had a visit from a sort of good fairy, and were ten thousand pounds richer for it.

It fell to the hospital porter to receive the visitor, who was there and gone again in as little time as would have served to ask the time of day.

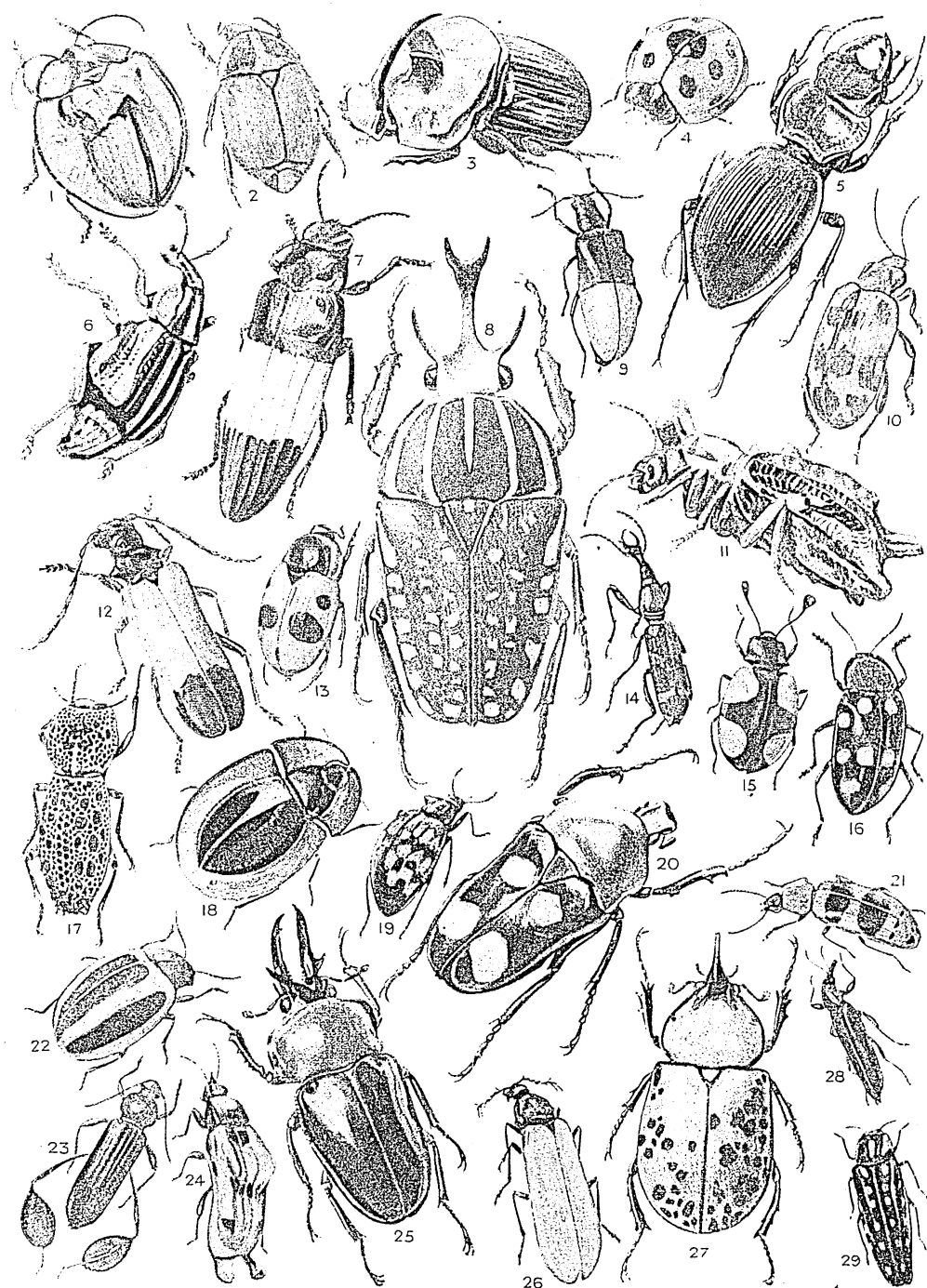
He was a rather shabbily dressed man, and carried under his arm a common-looking, brown-paper parcel, secured by big dabs of sealing-wax.

"That's for the hospital," said the stranger. Then he walked away.

The parcel was taken to the secretary's office, and, regarded as containing reading matter for the inmates, was left to take its turn with other packages. When it was opened it was found to contain documents worth ten thousand pounds, with a half-sheet of notepaper on which was written "For the good of the hospital." There was nothing more. Nobody knew who the good giver was.



FOREIGN BEETLES



1. Splendid dolichotoma (*Dolichotoma gloriosa*) 2. Macropopillia beetle (*Macropopillia arrowi*) 3. Emperor phanocus (*Phanocus imperator*) 4. Great synonymycha lady-bird (*Synonymycha grandis*) 5. Bates's monhotia (*Monhotia batesi*) 6. Bennett's eupholus (*Eupholus bennetti*) 7. Violet golden-surface beetle (*Chrysochroa castelmanni*) 8. Peratorrhina beetle (*Peratorrhina polyphemus*) 9. Blue and yellow hare beetle (*Lagria basalis*) 10. Fourteen-spot podontia (*Podontia 14-punctata*) 11. Solid heart-shaped sepidium (*Sepidium crassicaudatum*) 12. Dorcasomus beetle (*Dorcasomus delagorgusti*) 13. Four-spot paratasia (*Paratasia quadrimaculata*) 14. Marked arrhenodes (*Arrhenodes designatus*) 15. Beautiful horned euchteanus (*Euchteanus eucerus*) 16. Five-spot scaphidomorphus (*Scaphidomorphus 5-punctatus*) 17. Jourdan's lapherus (*Lapherus jourdani*) 18. Pierced olive beetle (*Helaeus perforatus*) 19. Variegated darling beetle (*Erotulus variegatus*) 20. Rucker's jumnos (*Jumnos ruckeri*) 21. Graceful lia beetle (*Lia elegans*) 22. Ribboned proseisceia (*Proseisceia vittata*) 23. Precious leaf-footed beetle (*Phyllocnema pretiosa*) 24. Single-horned xenarescus (*Xenarescus monoceros*) 25. Muller's phalacrognathus (*Phalacrognathus mulleri*) 26. Beautiful eupyrochroa (*Eupyrochroa insignis*) 27. Powerful tityus beetle (*Dynastes tityus*) 28. Wallace's belus weevil (*Belus wallacei*) 29. Great agrilus (*Agrilus grandis*).

See pages 6335 and 6336 for pictures in colour of British Beetles

Nature's Wonderful Living Family in Earth and Air and Sea



Fire-flies in a tropical forest

THE GREAT BEETLE FAMILY

WE use the word beetle contemptuously, but Mother Nature is fond of these creatures. They are among her most successful creations, hence their multiplicity, their infinite variety of size, pattern, gifts, and functions.

In species they outnumber all the back-boned animals by two or three to one; in the mass of individuals they are as the sands of the sea. Great Britain, with a climate not conducive to great variety of species, has between 3000 and 4000 known kinds, which is about a quarter of all our recognised insect population.

We should not be considered unjust to a beetle to say that brain-power is not its most notable attribute, though instinct in the order brings wondrous things to pass. It is rather in inherited equipment, in adaptation to life, that the beetles are chiefly distinguished.

They can move their powerful heads more freely than other minute folk; their external covering is extremely hard as a defence against attack, and they can eat so many things that they are at home practically everywhere.

They are, indeed, one of the most notable of all our groups of natural scavengers; creatures of which civilisation has to take account in balancing the books of human life. We may employ the name of beetle

as a term of derision, but we do not deride formidable enemies, and such we find among the beetles, in addition to a host of good and harmless allies.

We have but to remember the noble oak roof of Westminster Hall, which, defying the tooth of Time for eight centuries, fell piecemeal to the jaws of beetles. Let us further recollect that another beetle, if unchecked, would drive potatoes from the list of human foods.

Beetles are four-winged, but their tendency to put on protective armour has had the effect of slowly converting the front pair of their wings into horny coverings for the hind pair. The front pair of wings, or wing-shields, meeting as a rule in a straight line down the back, and guarding, not only the true organs of flight, but the soft after parts of the body, are called *elytra*. We have seen something of the kind in the earwigs.

Not all beetles have them. Some, indeed, are flightless. Generally this is so in the females, where the distinction occurs, but there are kinds in which both sexes have mimicked the penguin and discarded flight, though the *elytra* or wing-covers remain to tell the tale of past possessions of the beetles.

Not only is there great diversity in pattern and proportions in the various

PREHISTORIC LIFE · MAMMALS · BIRDS · REPTILES · FISHES · INSECTS

species of beetles; there are striking differences in size in the same species. Uniformity being the characteristics of a species, how are we to account for this divergence from type?

The explanation is that the big beetles have prospered in the larval stage more than the small ones. For food supply and fair conditions govern the growth of beetles as of babies. In a larger classification, and ranging over the whole order, we find the smallest beetles less than a pin's head in size, and the monsters of the tribes, like the elephant and goliath beetles, nearly as big as a man's fist, and a South American giant beetle, six inches long and nearly as broad.

What shall we look for to assure ourselves that an insect before us actually is a beetle? The head is as a rule more broad than long, and sometimes, as in the weevils, shows that Nature has employed here, perhaps for the first time, the idea of the long proboscis, or trunk, which we find higher in the scale, in the shrews and tapirs, and paramount in the elephant.

THE WIRELESS RECEIVERS OF THE BEETLE KINGDOM

The head is furnished with two large eyes, and sometimes with smaller auxiliary eyes, called ocelli. The lenses may be plain, but more frequently the eye is composed of many facets. Sometimes it is divided, for what purpose is not plain in all cases. In the whirling water beetles this division is complete, so that the two eyes of these creatures are, in effect, four.

To the head are attached the antennae, or feelers. A chapter might be devoted to these organs alone. They are of many shapes and designs though nearly always, in all species, composed of eleven-jointed segments, imparting extreme flexibility.

They are organs of touch, but more than that. It is thought that smell and hearing reside in these feelers. But do beetles hear? In the ordinary sense they may not. They may catch air vibrations and little shocks communicated through solid bodies, and feel, as we believe fish do, rather than hear in the human way.

The antennae of wireless receiving stations pick up electric impulses, born of sound, as they travel through the ether, and give them to us reconverted into sound waves, through the telephones which we place to our ears. Is it not possible that the antennae of insects are

their wireless receivers, and that they have some function which translates sound impulses to them?

There are beetles which create sound by scraping one part of the body against another. It may be the legs against the edges of the wing-cases, but it may also be the rubbing of one part of the body against another which has a specially rough, file-like surface. Surely, it may be thought, with such elaborate preparations as these for the emission of sound, there must be a hearing faculty in the insect.

THE WONDERFUL AND VARIED ANTENNAE OF THE BEETLES

Wireless picks up everything which can be heard by an ear—and more; it receives electric disturbances from the atmosphere which no ear could perceive. The fiddling and scraping by the beetles may be conveyed to the senses of their fellows by Nature's own wireless.

Whatever the method, common agreement recognises the antennae as the receivers, for beetles have no ears. Some of these wonderful antennae taper away to a bristle-like extremity; some have thread-like ends, though uniform throughout in thickness; some, again, are composed of rounded joints, like strung beads: feelers with long processes arising from each joint, feelers thickened gradually towards the ends, like those of butterflies, feelers which suddenly swell into thickness, and feelers, as in the case of the cockchafers, which have elaborate fan-like structures.

In that list all the beetles are included, we believe, and if all other clues to identity failed, those details, found on an eleven-jointed antenna, should guide us with certainty to the fact that we are in the presence of a beetle.

THE BIG FAMILY OF TIGER-BEETLES THAT WORK FOR MAN

If it is a beetle, is it friend or foe? There are good and bad in all orders, judged from human standpoints, though not from Nature's. Beetles live by eating, and their meal may be some horrid grub gnawing the roots of growths precious to our gardens, or, it may be, something else that we much prize. For they are found everywhere.

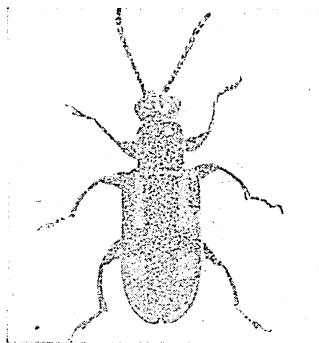
The lovely tiger-beetles, of which some thousand and more species are known, are unanimously on the side of man, in that they live by eating our enemies.

THE GREAT BEETLE FAMILY

Well, their diet suits them, for though they are good fliers, they show immense activity on foot, and turn their nasty diet into the loveliest tinted mail whose fine metallic hues the humming birds could not outshine.

At the first peep we meet once more the old mystery of colouration. The beetles are, generally speaking, a secret folk. We do not perceive their millions and billions because they do not obtrude

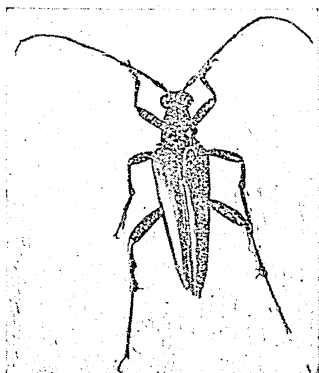
We have tiger-beetles at home among our farmer's and gardener's friends. Side by side with them are other beetles doing good work for us. How shall we tell whether these other little flesh-eaters are tigers or not? They are ground beetles, too, and we cannot be in doubt if we remember that the carnivorous ground beetles are always comparatively dull in colour, the tigers never, and that the tigers have a flexible hook to the inner



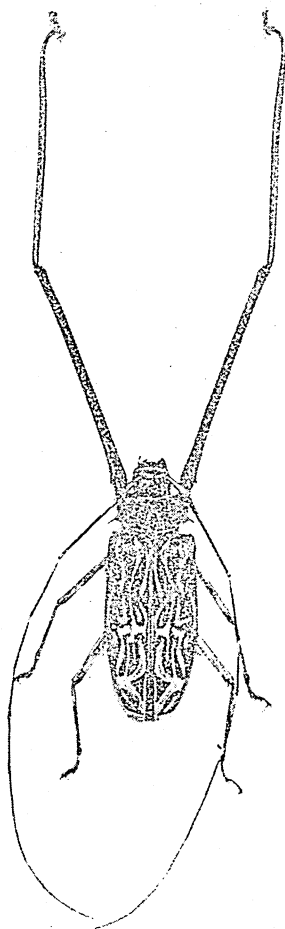
ASPARAGUS BEETLE



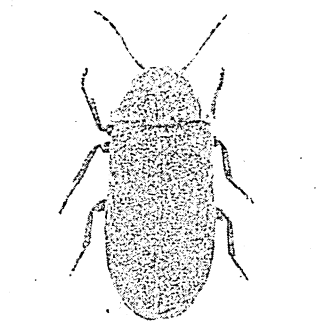
CARABUS AND BOMBARDIER BEETLES



A LONGICORN BEETLE



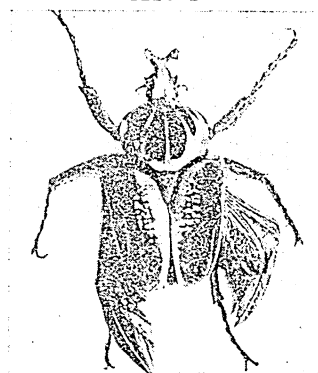
HARLEQUIN BEETLE OF BRAZIL



THE DEATH-TICK



CELLAR BEETLE



GOLIATH BEETLE OF AFRICA

themselves on the waking world. Hosts of them are nocturnal; still more hide in the soil, in moss, under the bark of trees, beneath stones.

The present writer while working in his garden has often unearthed beetles of rich copper and lustrous green, deep down in the soil. What purpose can that beauty serve down in the darkness of the earth where their rich colouring cannot be seen?

lobe of the maxillae which is lacking in the others.

But we have greater wonders here, though less ornate. There are brightly coloured species among the *Carabidae*, as they are called, but then all the tigers are gay. Our wonder now arises from different causes, for it is among this assembly that we find the master gunner of the order, the Bombardier.

The big fellows of the genus belong to the tropics, but in southern England, on the chalk and near the mouth of the Thames, we have a little one as interesting as any in the world. By some means this little beetle has contrived a defence of astonishing efficacy.

When menaced it emits a highly acrid, offensive fluid. That, of course, is not unique, for many insects do the same thing. The marvel here, however, is that the fluid issues with what, in the insect world, must be a tremendous report. A dozen times in succession the little gun-squirt is fired, and at each pop out comes a tiny jet of fluid. But it does not remain a jet. It breaks up into a finely-divided spray almost of gas.

As the carburetter of a motor-car sprays fluid petrol into a gas for the cylinder, so this beetle mechanism converts the little jet of acid into a spray of vapour, unpleasant to the nose and capable of making the eyes water.

What comic perfection of defence it seems to us, this little marvel going about his tiny world amid the roots of vegetation and under a beetle's dome of stone—a pebble half an inch in diameter—angrily gassing its enemies.

THE QUEER LITTLE CREATURE SHAPED LIKE A FIDDLE

The *Carabidae* have the *Carabus* genus as their type, 300 species in number, and remarkable for the fact that all save one known species are confined to the North Temperate Zone. The solitary exception is found as far away as southern Chile, a problem in distribution which makes many an entomologist pucker his brow.

One of the *Carabidae*, common to East Indian isles, is only a museum curiosity with us. It is worth seeing, for by some unaccountable modification it has assumed the shape of a fiddle, and has the popular name of Violin Beetle. Many of the group are skilled burrowers, in woods, in the banks of streams, and even down to the margin of the sea. They reveal themselves but little; they lie lurking in their secret places, seeking whom they may devour.

For that both sides must settle accounts with Nature. For us it remains but to be grateful for this unchecked war. The carnivorous ground beetles do work that we ourselves cannot. So many injurious grubs harbour in the soil, out of sight, that we are unable to reach them. Who

can grapple with the caterpillars which devour his rose-leaves by night and hide in the earth by day? We cannot do it. The ground beetles must, or our roses will perish, and with them our patience. Heavy is the debt we owe these little winged people who tread the hidden depths of the soil and natural subways.

THE LITTLE DIVER WITH A SPLENDID HEM OF GOLD

The *Carabidae* brought us to the water's edge. Let us pause by a pool and see their fresh-water cousins, the carnivorous water beetles, at their daily occupation. There are several species of *Dytiscus*, the Latin name given to these fine cruel creatures, because it means "fond of diving"; but *Dytiscus marginalis*, with the hem of gold, is the commonest we have.

We all know this beetle, though not its story. See it pop up from below to the surface, stick the nether extremity of its body out of the water to collect a bead of air, then turn and dive again, and we know at once it is dependent on the atmosphere for respiration, as we are. How, then, does it breathe in the water beneath which it stays so long at a time?

The air it collects is snared beneath the *elytra*, and is gradually absorbed in the body by the spiracles which run along both sides of the body and thorax. Its larvae are air-breathers also; there is no gill-breathing stage for them as there is for the tadpoles of amphibia. They also rise to the surface for their intake of the atmosphere. But, as all beetles undergo the complete transformation from egg to larva, from larva to pupa, from pupa to imago, which we have already pondered, we are brought face to face with the apparently impossible: an air-breathing chrysalis has to lie during its trance and conversion from one form into another, in the water.

A MOTHER BEETLE'S WAY TO MAKE HER EGGS SECURE

But here comes one of the strangest things in the beetle world. The egg is laid in a hole, bored by the tubular drill of the mother in the stem of a reed or other water plant. It hatches there and the larva enters the water. But when it is to become a chrysalis instinct impels the larva for the first time to seek the land, make itself a little burrow, and there lie quietly to undergo its change, always in contact with air. It leaves its burrow a perfect beetle, and flies to pond or ditch,

THE GREAT BEETLE FAMILY

to resume the work of rapacious destruction of life which it began, continued, and temporarily ended, as a grub.

Back now to the land, to find ourselves, it may be, challenged by that ferocious looking little gentleman in black, the Devil's Coach-horse. He is much better in performance than appearance, for, roaming far and near, he is ever after grubs, slugs, snails, and other things which eat our garden possessions.

THE TERRIBLE POWER IN THE JAWS OF THE FIERCE ROVE-BEETLE

What a fund of courage there is among the beetles! This one, if you threaten him with a finger or a pencil, will open his jaws and curl up his body with the apparent ferocity of a green lizard. But he really means it; he will seize the pencil with his sturdy jaws and hold with such grim wrath that you may swing him round and round without shaking him off. One has seen a Rove-beetle bite a caterpillar in halves at a single effort and march off with one half of his kill in his formidable jaws.

Our Rove-beetles have a nasty odour. Possibly some of the genus distil a sweeter perfume, or are ant and termite tastes less fastidious than our own? Whatever the case, certain Rove-beetles are welcome guests in the cities of these minute mighty ones, where, like the feebler green-fly of our own clime, they essay the role of milch cows, and surrender a milky fluid to the ants and termites in exchange for board and lodging. A curious point of the arrangement is that the Roves which house with termites do not lay eggs, but produce their young alive.

Of course, the Rove is not the only beetle occupant of the ant's nest, for every boy who has probed into the nest of our common yellow ant knows that there is a beetle there which is not a Rove. It is one of the *Clavigers*, whose antennae have but six segments, instead of eleven, and whose long head has no eyes.

WHY THE ANTS WELCOME BLIND VISITORS TO THEIR HOMES

The *Clavigers* are parasites, and could not live without the ants. Yet they return value for payment. They must dwell underground for ever with the ants, they must be fed by the ants, like the ant queen and babies. As a set-off for this service they secrete a juice dear to the palate of the ants.

The beetle is sightless and wingless. It can neither see nor fly, yet it flourishes. There are nearly a score of species of it, and all, so far as is known, make ant homes their almshouses, and all claim food and washing, as of right, in return for the substance which, useless to themselves, they distil for the sole delight of their hosts, servants, and masters, as indeed the ants are to them.

Next a larger group, the carrion beetles, which include those whose habit of burying their feasts has earned for them the title of sexton or burying beetles.

Whatever may be the doubt as to the hearing of beetles there is no question as to the marvellous keenness of the sexton's power of smell. A mole, a vole, a mouse, a bird may die with no burying beetle in sight; yet, with extraordinary speed, up come the winged undertakers from everywhere to perform their useful task.

They remove the soil, grain by grain, from beneath the little corpse, and gradually sink it in a hole, then cover it over. The funeral is decently performed, the rites complete as far as human eye may see. But down there in the darkness, life is to be born of death. The mother sexton lays her eggs in the dead body.

NATURE'S LITTLE SCAVENGERS AND THE GOOD WORK THEY DO

The eggs hatch there; the larvae eat the flesh in which they were cradled, and sad corruption is transformed, to enrich the soil that has given it its last sanctuary. The operations of hyenas, jackals, vultures, and sexton-beetles are unpleasant, viewed as life-callings, but they are essential to the sweetness of existence, and millions of other forms of beetles are doing for rotting trees and shrubs and funguses what these little sad-looking parasites of the dead are doing for us in removing the evidence of the chapter of animal disasters.

Unhappily, some of the species are destructive of wheat, the leaves of sugar, beet, mangold-wurzels, and other crops of importance to man and animals.

The *Histeridae*, 1200 species strong, are interesting though unlovely. While their staple food is manure, they attack and devour the great and powerful dung beetle. Their nearest allies, the *Nitidulidae*, are devoted to the consumption of decaying vegetable and animal matter, even bones coming into their menu. Some are found about the punctures

through which sap escapes from the trunks and branches of trees.

That enemy of the raspberry, the raspberry-beetle, comes next, a little villain which devours the blossom whence the raspberry should spring, and in a later stage despoils the fruit itself. But enemies more to be dreaded than these are the *Dermestidae*, a widely ranging group of beetles which in the adult stage are harmless, but in the larval condition work havoc in bacon and cheese, in the stuffing of upholstery, and in the treasure cabinets of our public museums and private collections.

A DESTRUCTIVE RAIDER OF PRECIOUS COLLECTIONS IN MUSEUMS

There are some which have a passion for dried skin, feathers, and fur; there are those whose appetite is at its freshest when rare insects are the objective. It is a matter of the greatest difficulty to keep them out of such collections, and the rarest specimen of bird or insect might be destroyed by their active and indiscriminate jaws. The only exhibit of its kind in the world would fall before their wicked little mandibles as readily as the commonest specimen.

A word next on the stag-beetles, the finest things we have in the order in England. The larvae live in the wood of old oak and other trees of ancient record, and, so great is the amount of structural work to be done in getting them from the grub to the perfect condition, with mailed coat and jaws resembling the antlers of stags, that three or four years elapse before the process is complete.

These lead us to a mighty host called the *Lamellicornia*, the group in which are the scarabs, the sacred beetles of the Egyptians. There are scores of species of scarabs, common to southern Europe, where Henri Fabre studied them and wrote one of the most fascinating of his essays on the life-habits of these consumers of animal refuse.

THE ROOKS THAT PROTECT OUR CROPS FROM A VORACIOUS ENEMY

Nearer at hand we have *Lamellicorn* examples in the cockchafer, which, while entitled to their life in the woods and the food they eat there during their four or five years larval stage, are deservedly hated for the ravages they commit among our cultivated crops.

They are as voracious as locusts, though happily not so numerous. But if they

were not kept down by the rook and other birds, they would gradually eat our land bare, for throughout the grub stage they are fiercely hungry, and are ruinous in effect on crops and foliage. They have risen at times to plague proportions, and there are records of their choking the wheels of mills in English waterways, and covering parts of Ireland like swarms of bees, when they become a danger.

They burrow into concealment, so that we know not the extent to which they are increasing; but the marvellous detective instinct of the rook and its allies tracks them to their hidden lairs, and when we see our sable guardians at work digging in our fields, let us, instead of shooting them on suspicion, investigate their meal; we shall often find it consists entirely of these devastating cockchafer grubs which, left to their own ill doings, may cause us damage amounting to millions a year.

It is with an aching heart that one has to confess that the click-beetle is in the conspiracy against our peace. The beetle itself is one of Nature's comedy characters. You pick it up and it clicks like a clock-work toy; you put it down and it leaps into the air with the amusing alacrity of a still better toy. But in its larval stage it is the dreaded wireworm, which by its numbers is ruinous to crops.

THE TERRIBLE DESTRUCTION WROUGHT BY THE LARVAE OF A BEETLE

One has seen land where root crops have come only in small patches, leaving great spaces of soil bare. That is the work of wireworms below. When a field has become infested the farmer puts on his heavy roller before sowing, and tries to make the sub-surface so hard that the pests cannot get up to gnaw his surface-rooting stuff, but you know as you witness the operation that that is only a temporary palliative. The soil should be opened up so that birds, the only natural police force in such matters, may get at the larvae and, devouring them by thousands, convert them into song and flight and eggs of other baby birds.

Next come the delightful glow-worms, rightly placed here, for they are not worms but beetles. Everything that crawled was a worm to our ancestors, down to Shakespeare's day and beyond; even the snake with which Cleopatra killed herself was called a worm, and so the crawling founts of light, the *Lampyridae*, were called glow-worms.

THE GREAT BEETLE FAMILY

To some extent the wingless condition of the female glow-worm excuses the blunder, but the male is a bold winged flier, and it is to call him to her side that the sombre little lady among the grass, supping on snails and slugs, lights her gorgeous lamps, little gleams of greenish radiance bursting at her will from organs arranged along the edges of the two last segments of the body. The male has, in a lesser degree, this gift of radiance, and he lights up too, as some think, with a view to frightening off enemies. But the signal is probably more frequently used as a call to mates than as a threat to assailants.

LIVING STREAMS OF FLAME IN THE FORESTS BY NIGHT

Our English glow-worm is *Lampyrus noctiluca*, but its brighter cousin, *Lampyrus splendidula*, its brilliance reflected in its title, comes no nearer our ken than central and southern Europe. Even so, our English examples give us a good idea of what Nature can do with her heatless ever-trimmed lamps.

It is in the New World that such natural schemes of illumination have reached their zenith. There the fire-flies, exotic members of the group to which our click-beetles belong, have attained such a marvellous power of radiance that as they fly through the forest at night, the air seems to catch fire and to burn in streams of flame behind them. The effect is purely a trick of the eye, of course, for the light is part and parcel of the beetle's anatomy and not an external entity.

For long the light was supposed to be phosphorescent, but two Indian students took up the study, and by a series of fascinating experiments proved that the light of the fire-fly is akin to X-rays and ultra-violet light.

When placed in the dark they lit their lamps with such effect that the light traversed opaque objects, leather, wood, black paper, flesh, and recorded itself on photographic plates. There is an unexpected marvel for you, the opening of a little door into an undreamed world of scientific magic.

HOW A BOTTLE OF FIRE-FLIES HELPED A FAMOUS DOCTOR

After that the old stories of how natives in Cuba and elsewhere light their huts and cottages by night by means of a few fire-flies caged in a prison of glass, and of how native beauties wear them like live diamonds in their hair, cease to astonish

us; but it is worth adding that during the Spanish-American war in Cuba, Colonel Gorgas, who was later to immortalise himself in connection with the Panama Canal, carried out an operation by the light from a bottle of fireflies.

So much for light. Let us turn to the dark, and the boring beetles which delight in it. Chief of them for our purpose is the so-called death-tick beetle, or as science knows it, the *Xestobium tessellatum*. The furniture people call it the wood-worm, because its soft-bodied larvae, when found in the wood, look like little worms. But to the writer, when a little boy, it was made the symbol and song of terror as it has been and is to millions of others.

It is a beetle which lives in dry wood and feeds on the substance of its home. It has a hard little head which we cannot imagine ever to ache, seeing that it uses that organ to bang on the floor of its dwelling to its female counterpart in some other tunnel in the furniture. And the answer is made by similar means. The taps are their code of signalling.

The sounds are heard only when rival noises are muted. Naturally they are most perceptible in the still watches of the night. It is when we sit with sorrow brooding in our hearts by the bed of some poor sufferer, that we are most apt to notice them.

THE SILLY SUPERSTITION THAT GAVE THE WOOD-WORM ITS NAME

We all die when God wills, and if our last couch be in a house where the timber or the furniture is old, then watchers hear the tapping of the beetle and recall it afterwards as part of the fabric of sad incidents associated with those woeful hours of waiting.

So in course of time a sound, heard only in the stillness of a sick room, came to be reported as an omen of death.

It is a miserable superstition, which has poisoned many a mind, old and young, with unnecessary fear. The so-called death-tick is always ticking, day and night, wherever it has its habitation.

There is a danger in the beetle far more real than this ignoble legend. It is destroying some of the noblest woodwork in the world. It ate nearly all the grand roof of Westminster Hall, as we have noted; it has been found in other great old buildings in London; it is in the timbers of cathedrals, churches, and mansions famed in literature and history.

To eradicate it proved an almost super-human task. For years and at a cost of over a hundred thousand pounds, men worked at Westminster, taking out huge beams where the beetles had made holes big enough to receive the entire body of a man. The worst parts of the timber were taken away bodily and replaced by steel, then the remainder was treated to as severe a gassing as was employed in actual warfare during the preceding years.

THE INTELLIGENT BABY THAT BRINGS ITS OWN CRADLE TO EARTH

It is a blessing that the Longicorn beetles are not as prolific as some others we have considered. Their larvae are so deliberate in putting on the garb of maturity that a 17-year cicada is a mere youth in comparison with the veteran babies of the order. They are white, helpless-looking things in the larval stage, but Nature has packed the babies as full of wisdom as their mothers.

Some Longicorn mothers, having laid an egg in a small branch of a tree, cut a ring right round it, so that the wood withers, and eventually down comes baby, cradle and all, with the happiest results. But in another species the infant is the architect of its own fortune. Having reached the desired degree of growth, and feeling a disposition to become something better than a grub, it enters a large limb of the tree, bites it all round, and so secures its descent to the ground. And in that wooden sanctuary, the baby becomes a chrysalis and emerges a winged Longicorn beetle.

When food, warmth, and moisture from sap are favourably furnished, some Longicorn grubs complete their change in a year, but, in adverse conditions, their infancy may be enormously prolonged. Mr. Gilbert Smith, an architect by profession, but a rare insect student by choice, has found that the pupal stage of the *Prionus cornarius*, an inhabitant of beech and oak, regularly requires twenty years to pass from the grub stage to the imago.

THE SURPRISE WHICH MAY AWAIT US IN OUR DINING-ROOM TABLE

We need more information as to the normal processes with regard to other Longicorn larvae. For example, *Monoctonus confusus* has been known to issue from the wood of furniture manufactured fifteen years before—how long had it been there before the tree was felled?

Other Longicorn larvae have buzzed out of tables twenty-eight years old, and one travelled about the world for years, quietly devouring the wood of the "tree" on which a careful and observant owner stretched his boots.

But the record, so far as is known, was attained in 1924 by a larva which had travelled all over the world in the wood of a pencil-box. She was for twenty-five years the property of a doctor, and wherever he went the larva in her pencil-box was sure to go.

Her owner never had any trouble with her except for the fact that she was rather unmannerly in the sense that she was noisy in eating, and at nights, when banqueting on her timber, would wake him up with a clatter of her jaws. After a quarter of a century the doctor wearied of his responsibility and handed the larva in its box to the Natural History Museum at South Kensington.

THE PART THE BEETLES PLAY IN THE RISE AND FALL OF HUMAN FORTUNES

The museum officials received her with the grave attention due to a baby of such antiquity, and added a fresh piece of wood to the resources of her cradle-larder. For another six years she mused and gnawed and nodded. Then she died, certainly thirty-one years old and possibly much older, the most ancient baby ever known on earth. The tragedy was that, as she did not reach maturity, we shall never know to which of the 30,000 species of Longicorn beetles she belonged.

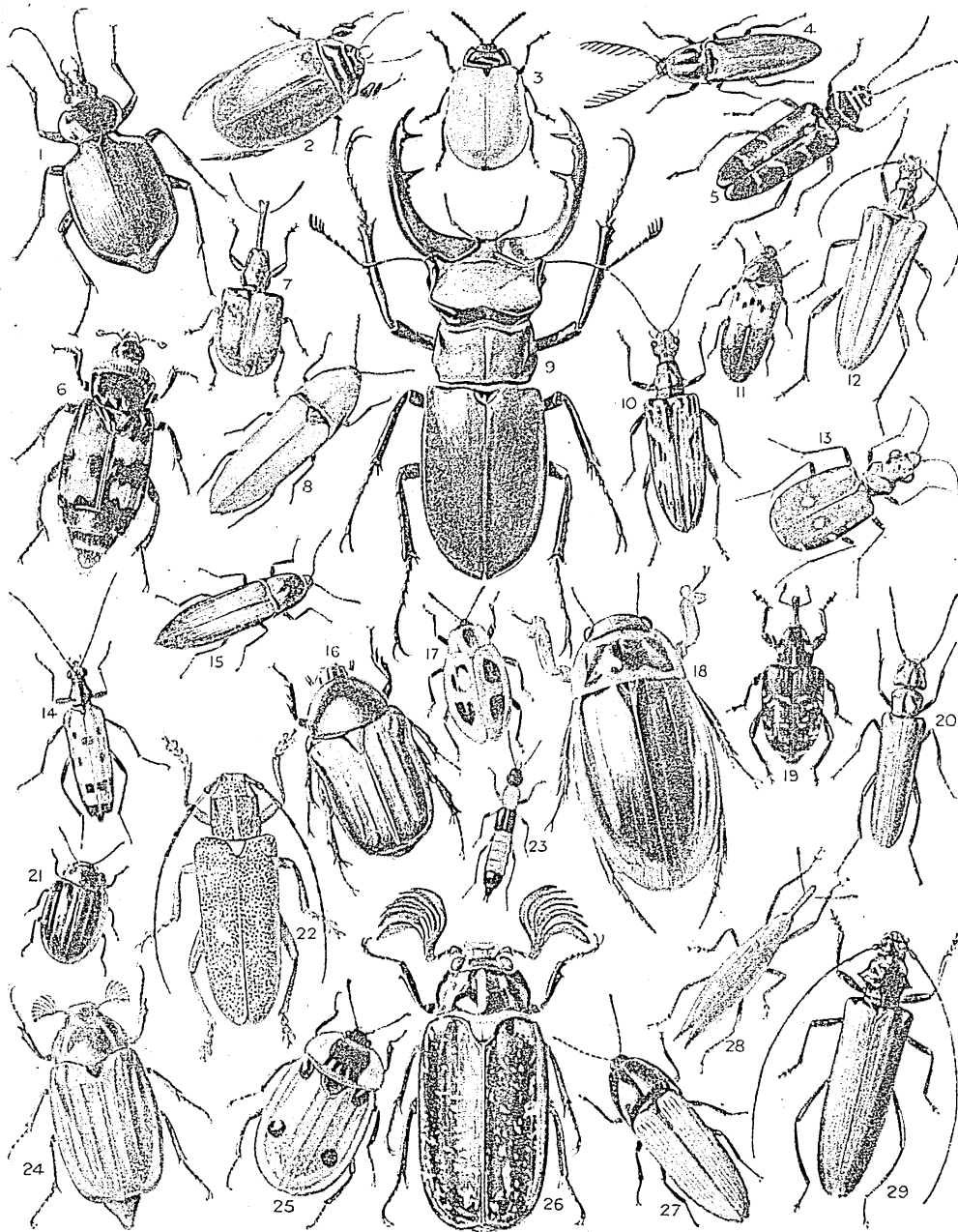
There remain multitudes of other beetles for the student of the subject; oil beetles whose larvae lie in wait for bees, seize them by the hair, and ride home to dwell in the hive and batten on bee grubs; all the monstrous company of weevils, which infest our nuts, clovers, foliage, apple blossoms, cabbages, grain, and tree trunks; the beetles which devour our peas and beans; the ladybirds which police our roses and other growths imperilled by the voracious green-fly.

We do not know half the species of beetles which are found in the world. But we do know, as is clear from these notes about them, what an immensely significant part these swarms of big and little creatures play in the rise and fall of human fortunes.

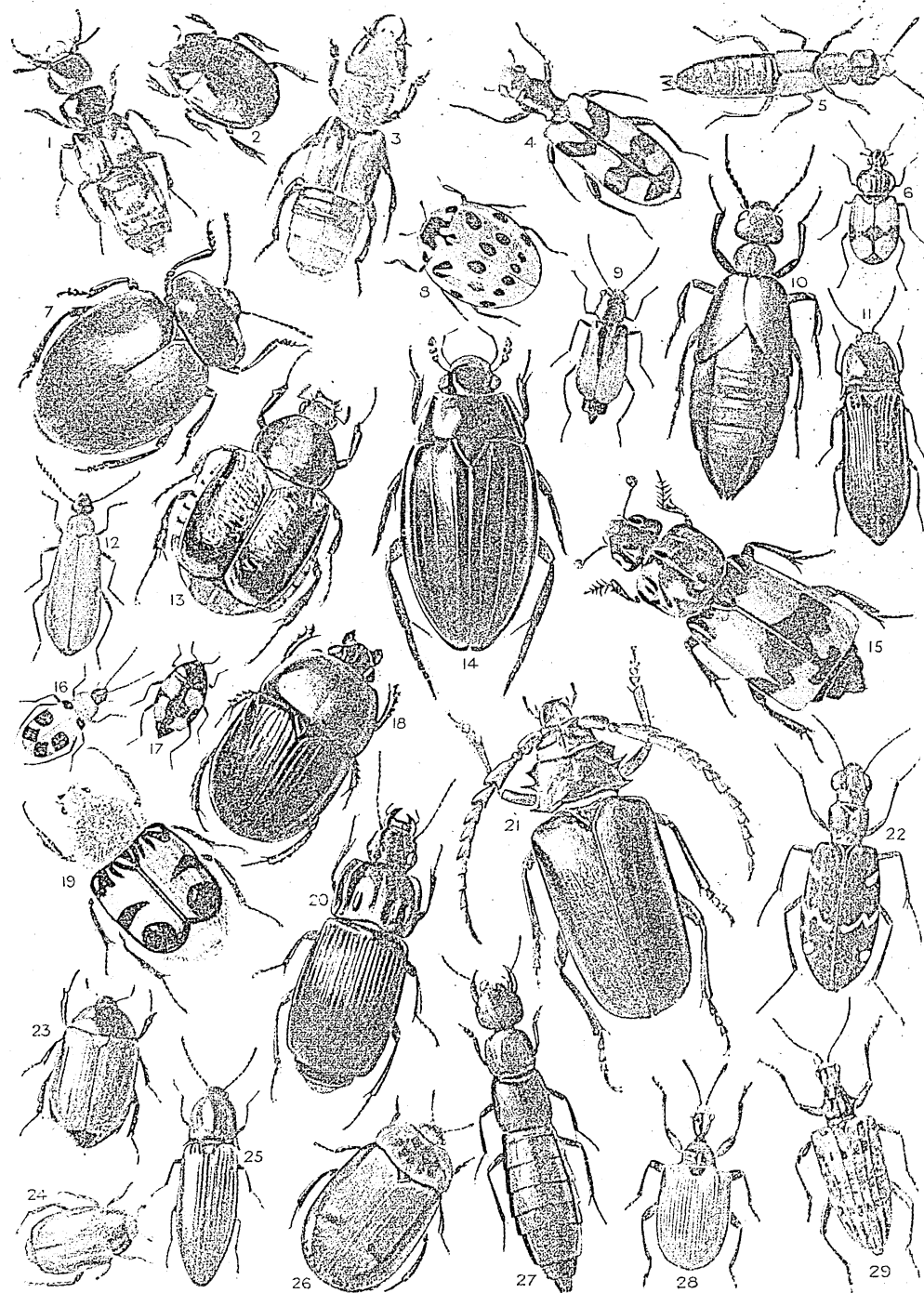
See colour plate facing 6327
for pictures of Foreign Beetles.

BRITISH BEETLES

1. Sycophant calosoma (*Calosoma sycophanta*) 2. Lesser water-beetle (*Acilius sulcatus*) 3. Black-bodied poplar beetle (*Melanosoma populi*) 4. Horn-combed corymbites (*Corymbites pectinicornis*) 5. Arched clytus (*Clytus arcuatus*) 6. Vespillo burying beetle (*Necrophorus vespillo*) 7. Beaked Bacchus weevil (*Rhyncites bacchus*) 8. Rust-coloured dancer beetle (*Ludius ferrugineus*) 9. Stag beetle, male (*Lucanus cervus*) 10. Two-striped rhagium (*Rhagium bifasciatus*) 11. Bacon beetle (*Dermestes lardarius*) 12. Circled archer beetle (*Toxotus meridianus*) 13. Common tiger beetle (*Cicindela campestris*)

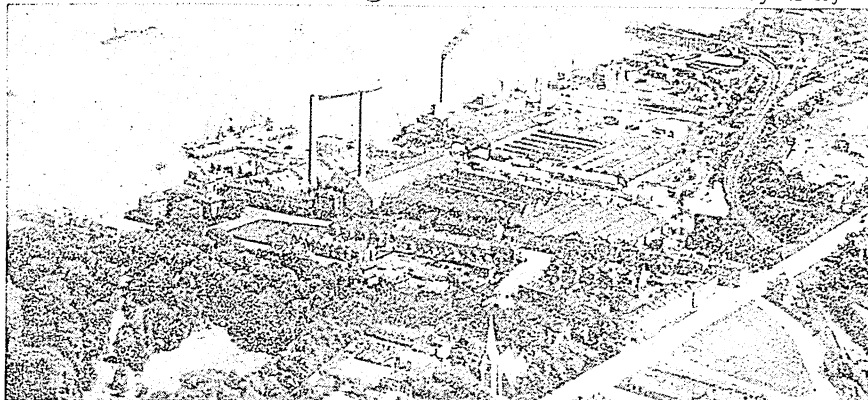


14. Spotted knot beetle (*Strangalia maculata*) 15. Copper-coloured corymbites (*Corymbites cupreus*) 16. Rose beetle (*Cetonia aurata*) 17. Scarlet fungus beetle (*Endomychus coccineus*) 18. Great water beetle (*Dytiscus marginalis*) 19. Pine weevil (*Curculio abietis*) 20. Blister beetle (*Lytta versicatoria*) 21. Golden-limbed cereal beetle (*Chrysomela cerealis*) 22. Sharp-pointed saperda (*Saperda carcaria*) 23. River paederus (*Paederus riparius*) 24. Common cockchafer (*Melolontha vulgaris*) 25. Four-spotted silpha (*Silpha quadripunctata*) 26. Polyphylla beetle (*Polyphylla fullo*) 27. Red skipjack (*Elatér sanguineus*) 28. Long-beaked thin beetle (*Lixus paraplecticus*) 29. Musk beetle (*Aromia moschata*)



1. Large-jawed flesh-eating beetle (*Creophilus maxillosus*) 2. Four-spot mimic beetle (*Hister quadrimaculatus*) 3. Hair tortoise beetle (*Emus hirtus*) 4. Hive beetle (*Trichodes alvearius*) 5. Red rove beetle (*Staphylinus coesareus*) 6. Sacred cross beetle (*Panagaeus crux-major*) 7. Dark timarcha (*Timarcha tengbricosa*) 8. Eyed lady-bird (*Anatis ocellata*) 9. Bronzed soft-skinned beetle (*Malachius aeneus*) 10. Oil beetle (*Meloe proscarabeus*) 11. Bronzed corymbites (*Corymbites aeneus*) 12. Cardinal beetle (*Pyrochroa coccinea*) 13. Noble gnorinus (*Gnorinus nobilis*) 14. Black water beetle (*Hydrophilus piceus*) 15. Burving beetle (*Necrophorus rufator*) 16. Beautiful horned beetle (*Callistinus unatatus*) 17. Four-spot bowl beetle (*Scaphidium quadrimaculatum*) 18. Dor beetle (*Geotrupes spiniger*) 19. Bee beetle (*Trichius fasciatus*) 20. Streaked-winged lightning beetle (*Pterostichus striola*) 21. Long-horned beetle (*Prionus coriarius*) 22. Wood tiger beetle (*Cicindela sylvatica*) 23. Frisch's anomala (*Anomala frischii*) 24. Flower-loving nophia (*Hoplia philanthus*) 25. Marked corymbites (*Corymbites signatus*) 26. Silpha beetle (*Silpha thoracica*) 27. Devil's coach-horse (*Ocyrops olens*) 28. Hazel apoderus (*Apoderus coryli*) 29. Rhagium beetle (*Rhagium inquisitor*)

The Story of the Things We See About Us Every Day



The paper mills by the Thames where The Children's Encyclopedia paper is made

A PIECE OF PAPER

TAKE care of the thing you hold in your hand: it is more precious than gold. Civilisation must fall to bits if paper goes.

It is the bridge between barbarism and learning, between anarchy and government, tyranny and liberty. Without it we should lose the inspiration that stirs the hearts of men and leads them to do great things. Let us think what paper means.

These pages are being written in the great Reading Room of the British Museum, and all round the room thousands of dead men are still speaking to the world, still influencing men, still making people laugh and cry by the books they have written. On the shelf close by are books by Plato and Aristotle and Caesar, and on another shelf are books by Tennyson and Wordsworth and Shakespeare and Goethe. All these writers have gone; some of them died more than two thousand years ago, yet here they are, still talking, still telling us what they wrought and thought when they walked the earth.

At first men painted or carved pictures and signs on bones and wood and bark and stone; then they made bricks of clay and stamped inscriptions on them; then they carved their hieroglyphics on the walls of temples. The Egyptians were probably the first people to invent a kind of paper, and the word papyrus was the name of the

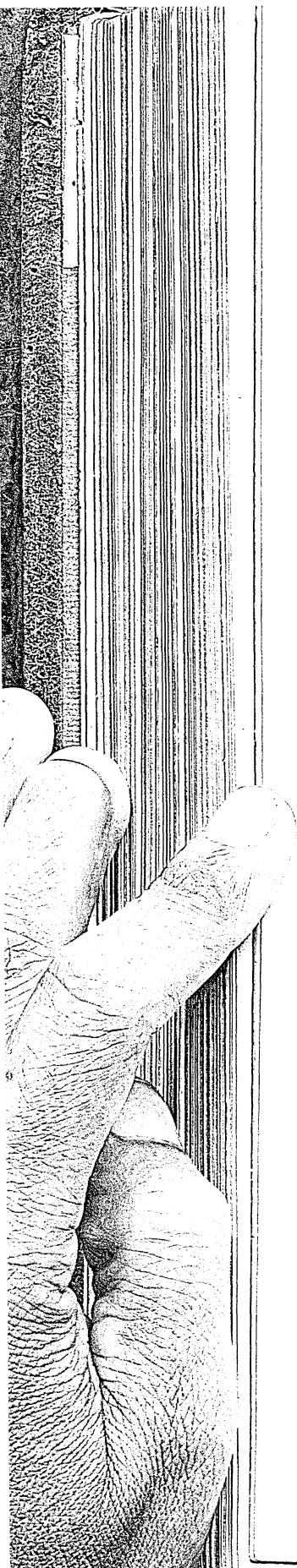
bulrush from which they made it. It is probable that the ark in which the little Moses was placed by the river's brink was made of this bulrush.

The papyrus paper was very primitive, and was not paper in the modern sense. The white pith of the papyrus was cut into long strips, which were laid side by side, with shorter strips across them, and then all the strips were cemented together with Nile mud or some other sticky substance, and beaten into thin sheets like paper. Even this paper served a very useful purpose, for many most interesting papyrus rolls have been found. One about five thousand years old tells of the reign of King Assa, and others contain writings of Homer and Plato and Demosthenes, and a long-lost work of Aristotle.

We really owe our modern paper to the ingenious Chinese. Originally the Chinese wrote on bamboo boards, or on a tissue of silk, but in the first century of the Christian era, or perhaps before, a clever Chinese succeeded in making paper of bark and hemp and rags, and even of old fishing-nets.

We do not know when the first piece of real paper was made, but there is an extraordinary story of the oldest paper documents which have come to light. It carries us away to the ruins of the Chinese Wall which stretch across the desert sands

INDUSTRIES · HOW THINGS ARE MADE · WHERE THEY COME FROM



of Turkestan. They have been explored by Sir Aurel Stein, who went out for the British Museum to trace the lost cities under Asian sands. Here and there along the ancient wall stand the ruins of old watch-towers, and in a heap of rubbish in one of these towers Dr. Stein and his workers made a wonderful discovery.

They found wooden tablets with Chinese inscriptions, a strip of silk paper with writing on it, and bundles of letters on actual paper, made from bark and rags. The letters were in an unknown tongue, but the language has since been translated, and there is evidence which convinces Dr. Stein that these three kinds of writing were deposited in the tower about the same time, and the date is fixed by the writing on the wooden tablets, which are dated in *the actual year of the birth of Christ*. Here in this ruined tower, with the sands of time blowing all about it, three civilisations seem to have met, and the first three kinds of writing materials lay side by side.

These letters are the oldest pieces of paper known. The oldest paper document known before went back to about a hundred years after Christ; these take us back, perhaps, a century earlier.

WHAT EUROPE LEARNED FROM CHINESE CAPTIVES

The paper the Chinese made in those days was made chiefly from the bark of the mulberry tree—the tree that silk-worms feed on, so that to the same tree we owe both silk and paper. In that first century, however, China was little known, and for about seven hundred years Europeans learned nothing about paper. It was only by an accident that paper-making found its way to Europe, and it was an accident of war. It happened in this way. In A.D. 751 the Arab governor of Samarkand, a city in Central Asia, captured some Chinese paper-makers, who were with a Chinese army invading his capital. These men instructed the Arabs, and the Arabs, in their career of conquest, introduced the invention into Europe.

In the history of the world many great wars have been waged and many great victories won, yet we may doubt whether any war had ever a more momentous effect on history than this little raid ending in the capture of the paper-makers.

Now, what was the secret of the Chinese paper? They mashed up the bark of the mulberry, so that the woody fibres were broken up and pulled apart.

The tiny fibres were then allowed to sink through the water on a grating, where they formed a kind of tangled felt-work which could be compressed together into a thin sheet. Roughly speaking, that is the principle on which the Chinese made paper, and, though paper-making has been improved and elaborated century after century, the principle remains the same, and all modern paper consists of a deposit of vegetable fibres. Not only wood but any vegetable fibre can be used, and about four hundred different kinds of woody fibre have been tried at one time and another, though the fibres now chiefly in use are cotton, linen, straw, wood, and esparto grass.

THE WONDERFUL THING THE SUN MAKES IN THE GREEN LEAVES

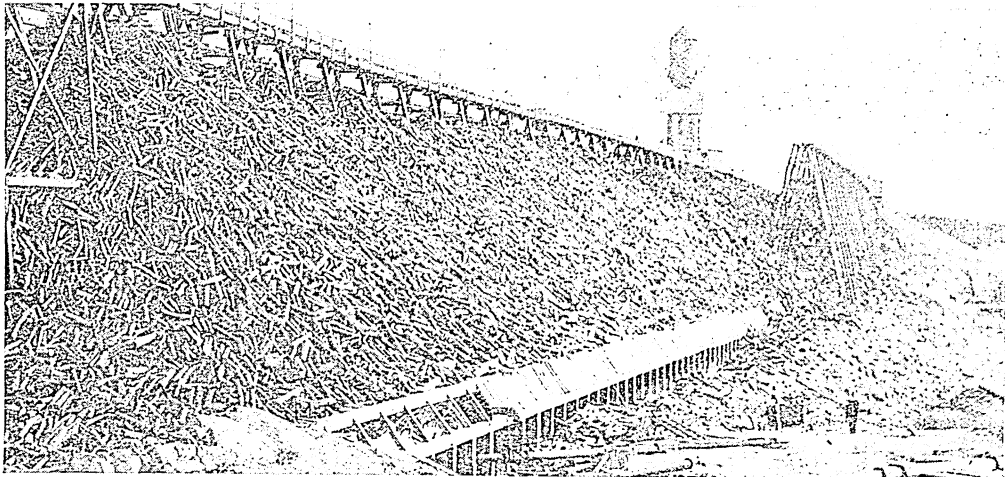
Vegetable fibre consists of a substance called cellulose, and, even apart from its uses in paper-making, cellulose is a very interesting natural product. No man has ever succeeded in manufacturing it. It is manufactured in green leaves by the Sun, and were there no green leaves of plants there could be no white leaves of paper. Chemically speaking, it is a carbohydrate—that is to say, it is composed of the hard, black substance carbon and the gases hydrogen and oxygen, and it very closely resembles starch and sugar. In fact, the Sun and the green leaf first make starch, then turn the starch into sugar, and then turn the sugar into cellulose; and these three substances are the most extraordinary simple substances in the world. For starch and sugar are the source of all animal life and energy, and cellulose, in the form of paper with a little ink on it, is the source of most of the intellectual progress of mankind.

THE AMAZING POWER IN THE WORLD OF STARCH AND CELLULOSE

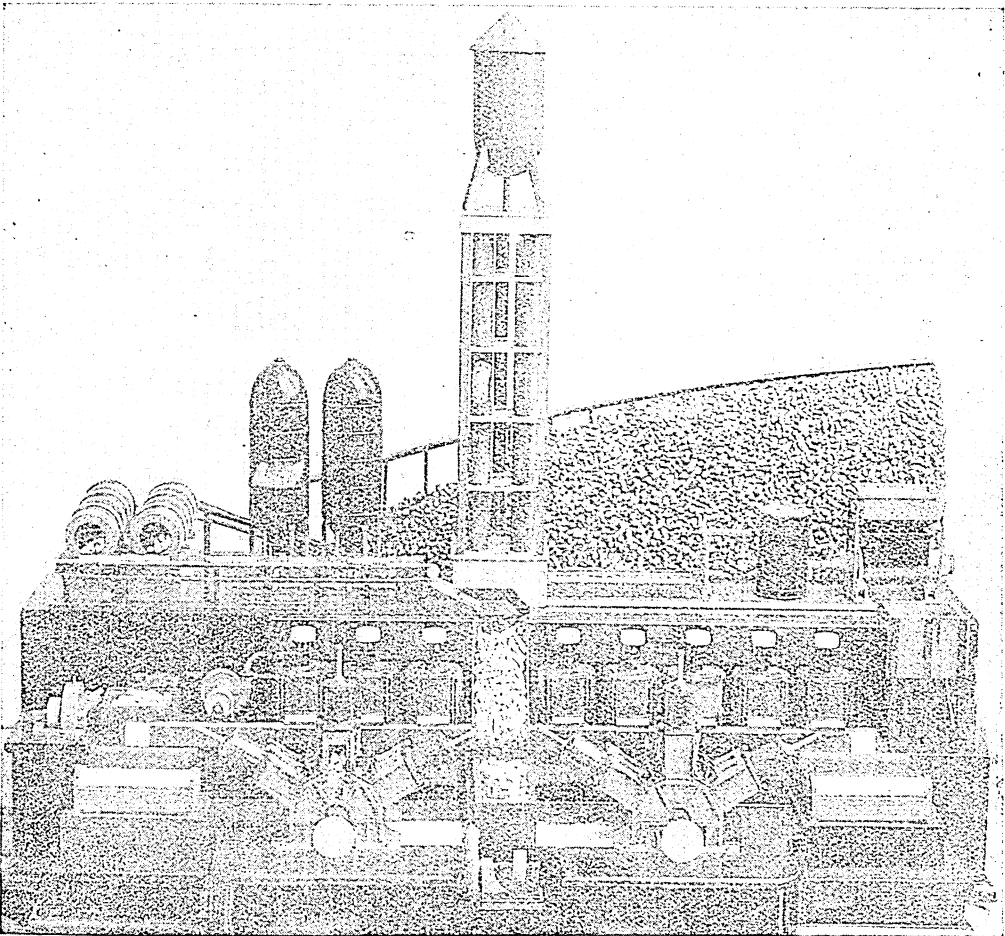
If a chemist were asked what is the most important elementary substance in the world, he would probably answer Starch, because starch is the material out of which all flesh is made, and the chief fuel of the fire of life, which gives energy to all living creatures. And if he were asked what is the next most important elementary substance in the world he would probably say Cellulose, because cellulose, with ink on it, is the most important fuel in the furnace of the mind and the soul of man.

Every time we write on a sheet of paper we should feel a sense of the wonder of the

THE MACHINE THAT TURNS TREES INTO PULP



The bulk of the world's paper supply is now made from wood pulp, and here we see a great pile of logs stacked at a pulp mill in Newfoundland, waiting to be ground into pulp. The paper of this book was made from similar logs.



To show in one picture the whole of the actual machinery which turns wood logs into pulp would be impossible, but we give here a photograph of a model of the machinery concentrated into a small space. At the top is the water-tank, with the acid tower below, and the block bin and trough below that. This model shows the apparatus for the chemical, or sulphite, process which makes the best and strongest pulp, and also the apparatus for the mechanical process.



FAMILIAR THINGS

world, and the strange way in which different and distant things come together and work together. Think! Where did this leaf of paper come from? It certainly was made by the Sun in some green plant, lying at first in the green leaf in the form of starch, and then flowing as a solution of sugar in the sap. Perhaps it was made of esparto grass from some Spanish or African meadow; perhaps it was made of trees of a Canadian forest; but it was certainly made of starch and sugar by the Sun, and now here we read on it words in ink, made chiefly of galls—the galls produced on oak-leaves by the poisonous secretion of a little insect.

THE FIRST PLACE IN EUROPE WHERE PAPER WAS MADE

The Sun, the plants, and the insects are all working to a far-off end! Out of black carbon and two colourless gases is made the white paper, and by arranging on the paper some streaks of lampblack, or a bitter substance produced by an insect, we can make the most potent instrument of intercourse, of truth and lies, of life and death, that the world contains.

Now to return to our paper-making. Paper was brought from China to Samarkand on the point of an Arab sword, and by the same conquering sword it was carried to Europe. Toledo, in Spain, was the first place in Europe to practise the art. That was in the eleventh century. In the thirteenth century the art reached Italy, and in the fourteenth it arrived in Germany, but not till the fifteenth century did it reach England, and not till the eighteenth was paper made in England in any great quantities or with any great skill. At first European paper was made almost entirely of rags, and even still rags are largely used, but now the main raw material is wood, and some publications, such as this book, have their own forests. It makes one's brain reel to think of mighty forests turned into sheets of white paper covered with the thoughts we write.

THE LITTLE INSECT THAT SHOWED MAN HOW TO MAKE PAPER

Thousands of years before man discovered how to utilise wood in this way (thousands of years before the Chinese paper-maker) a little insect, really the first paper-maker, had been making a paper nest out of wood. The wasp's nest is really a wood-paper, for it is made of paper manufactured from decayed wood,

and it was this nest that suggested the modern methods of making paper from wood-pulp. When Solomon advised the sluggard to go to the ant, he might also have advised the paper-maker to go to the wasp, but no one thought of going to the wasp till 1765, when a priest of Ratisbon, named Schaffer, began to experiment with wasps' nests and sawdust and wood shavings, and succeeded in making excellent wood-paper. His experiments were continued by a Dutchman named Koops, and by a Saxon weaver called Keller, who in 1844 made considerable quantities of paper from wood-pulp. The first manufacturers of paper from wood-pulp ground the wood into sawdust; but some chemical processes for making pulp were invented, and these have proved so successful that now wood is the chief material in paper-making. In 1800 about ten thousand tons of wood were used in England for paper; in 1900 a million tons were used; and the wood-pulp made annually for all the world is now over five million tons.

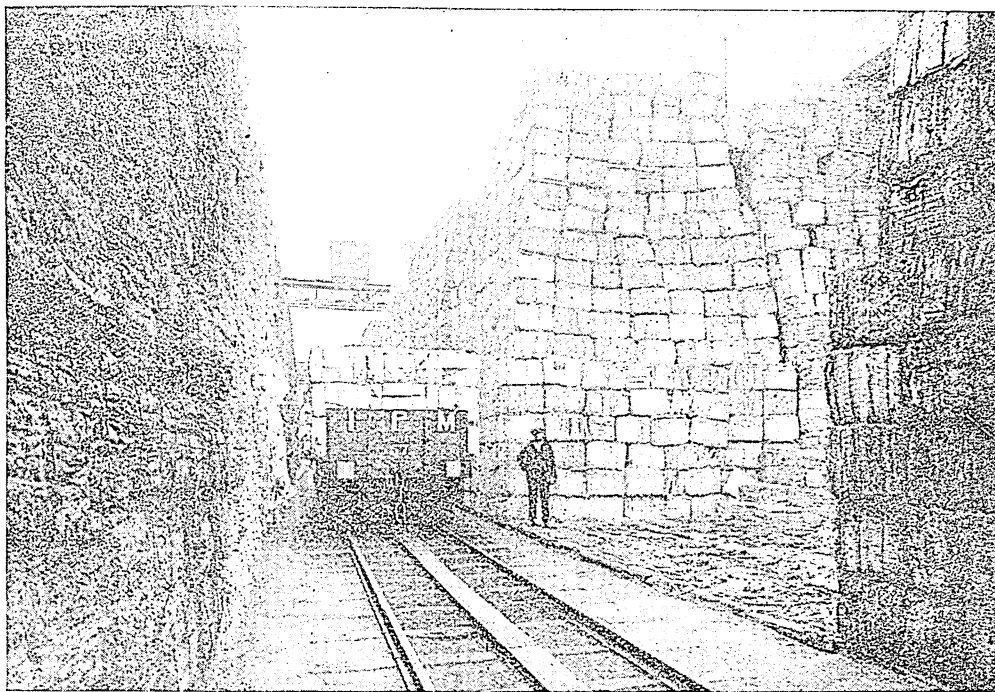
THE TREMENDOUS FORESTS WHICH ARE MADE INTO PAPER EVERY YEAR

Whole forests must be converted into pulp, for if we take land planted with trees nine inches thick it would require a forest of forty million acres in extent to supply pulp even for one year's paper. Since England has only three million acres of forest-land, all her trees would not suffice to provide the wood-pulp she uses in one year.

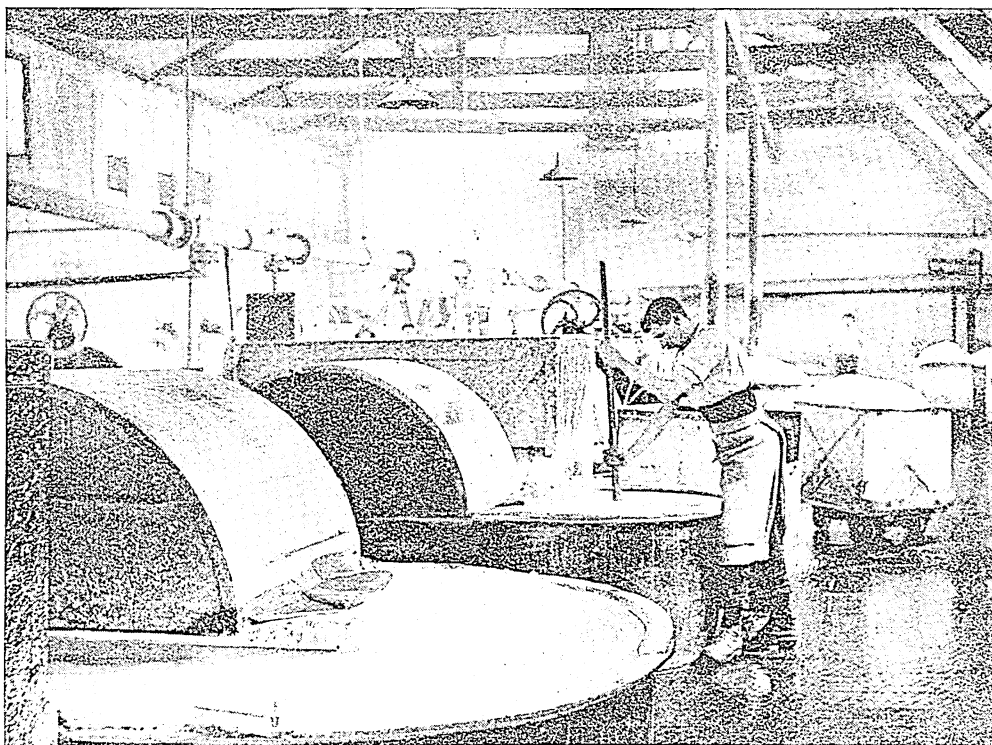
The area covered by all the paper in the world must be enormous. Forty million acres of forest for five million tons of pulp! One ton of wood-pulp will make over three acres of paper, one hundred and eighty tons of pulp will paper a square mile, while the annual output of five million tons is enough to paper almost thirty thousand square miles. The paper made in one year, therefore, would make a path a mile wide all the way round the world. If all the paper were in the form of a tape an inch broad, it would reach about twenty times the distance to the Sun.

The life and industry of a nation might well be judged from its consumption of paper. It is the best measure of a nation's mental energy, and if any lack of starch is a danger to its physical energy, so a lack of paper endangers its intellectual energy and its moral power.

PICTURE-STORY OF PAPER



1. In the mechanical process of turning wood into pulp all the original ingredients of the wood are ground up together. the fibre, resins, gums, and so on, but in the chemical process the foreign bodies are removed, and only the fibre is left. The pulp is made where the trees grow, and is then baled and sent to England, where it is stacked at the mill.



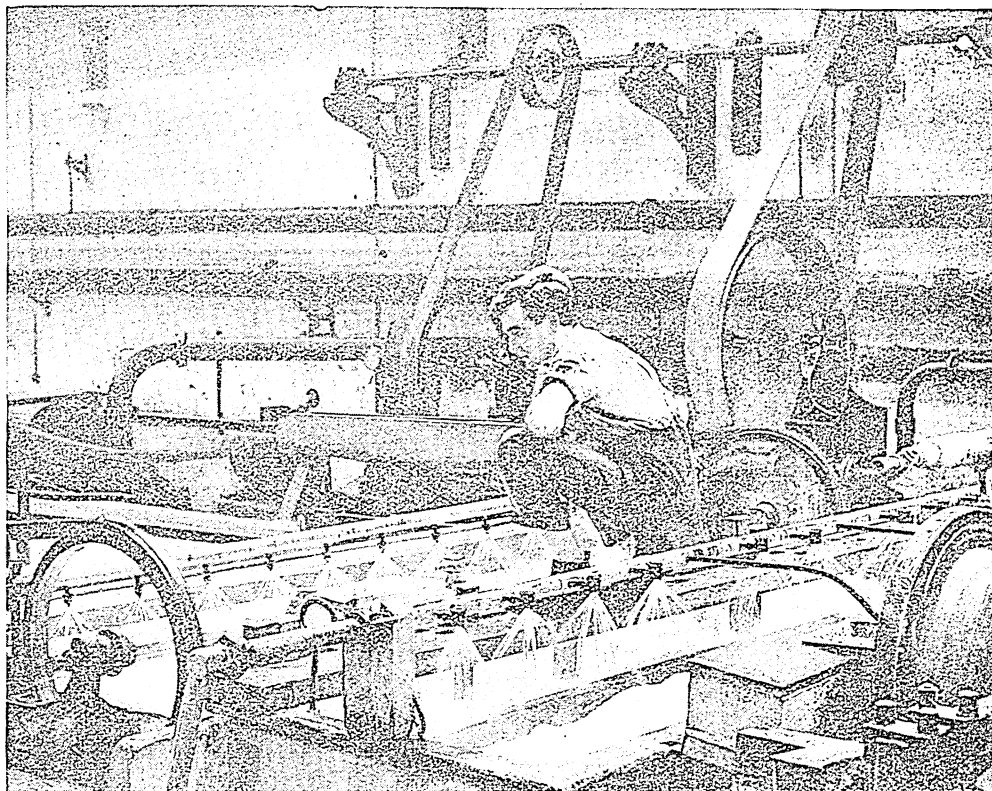
2. The pulp is broken up and mixed with water, and then, after the impurities have been drained out with the dirty water, the pulp is placed in these bleaching tanks, where chemicals are added to make the paper white.

A TON OF PAPER MADE EVERY HOUR

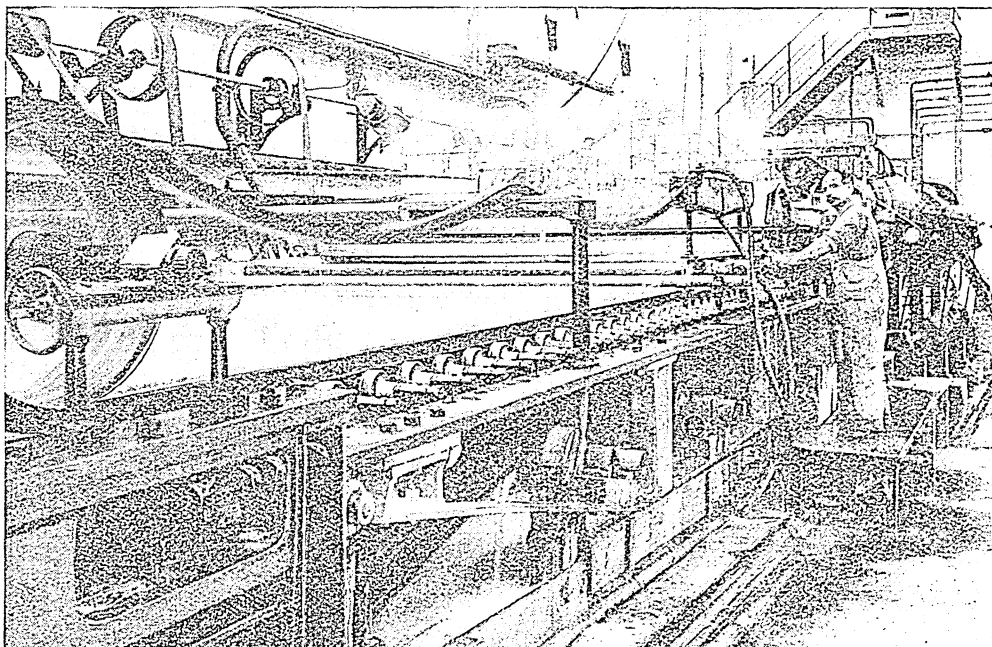


3. Here is the actual machine, about 200 feet long, which makes the paper out of the pulp. The material enters the machine as a thin watery fluid, and by a series of delicate and complex operations the composition is drained of its water, and the fibres felted together form over a ton of paper an hour. Several machines are working at the same time.

KNITTING THE FIBRES TO MAKE PAPER

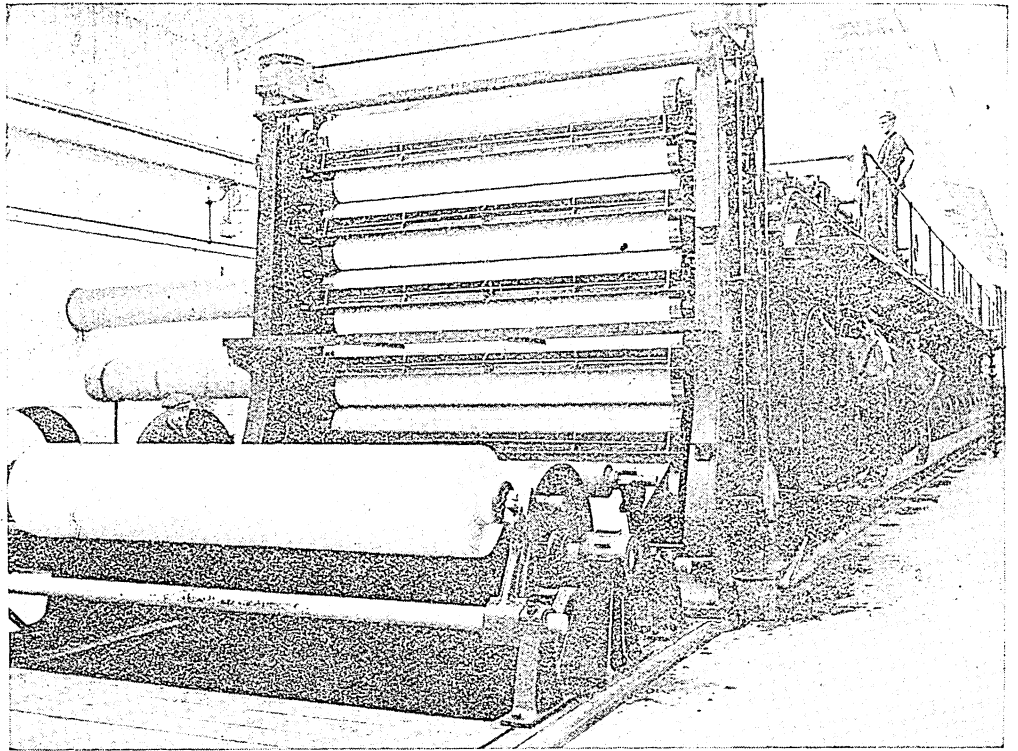


4. This is a closer view of part of the great paper-making machine seen in the last picture, and shows water being sprayed on the pulp to keep it moist, so that it will flow freely through the machine.

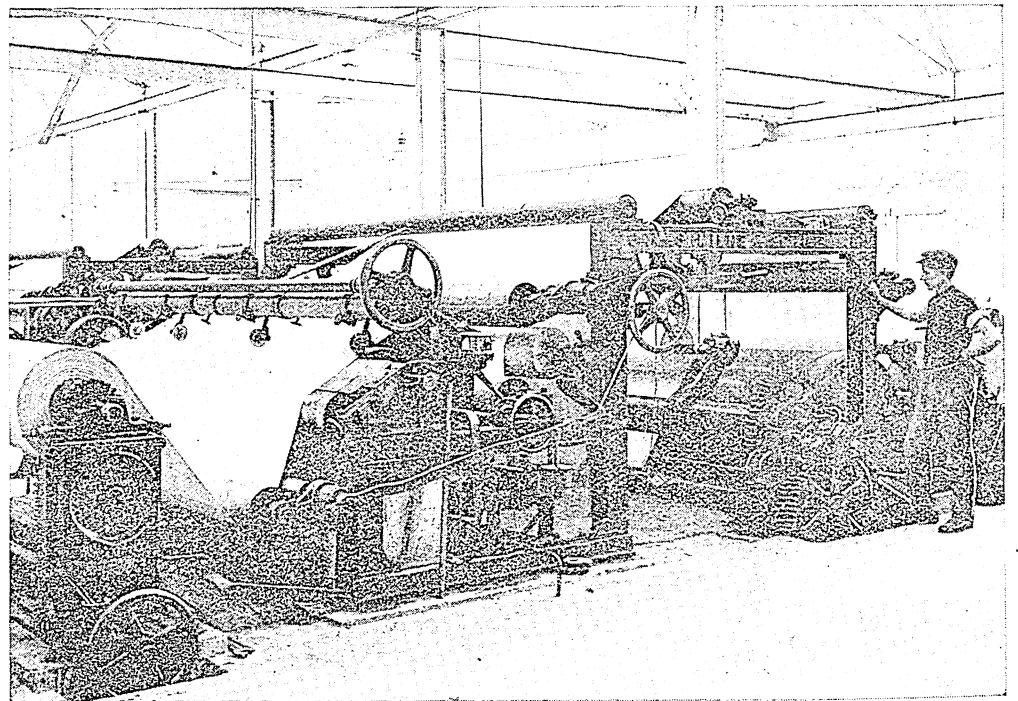


5. The principle of paper-making, whether wood-pulp, esparto grass, or rags are used, is that the fibre of the material shall be made to knit together to form a continuous sheet, and in this part of the machinery flowing water is carrying the fibres so that they will form a network and become paper.

FIVE MILES OF PAPER IN ONE ROLL

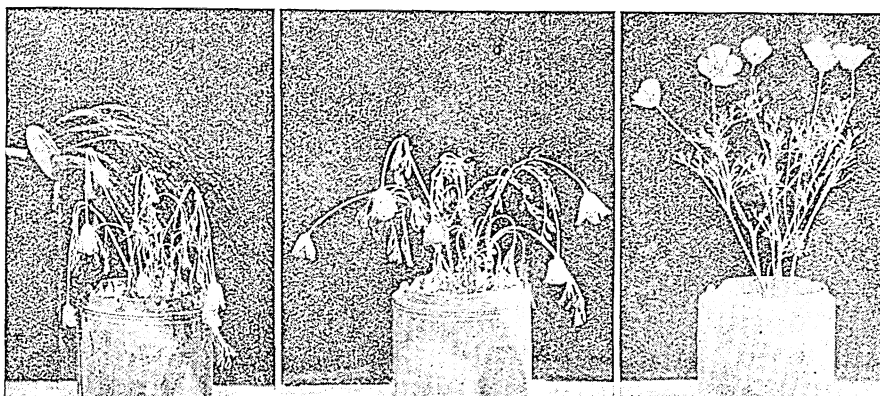


6. Here we see the paper passing between a maze of rollers which press and dry it, and give it a calendered surface, that is they make the surface perfectly smooth and equal, and give it a glaze which enables it to receive clear impressions of pictures like those on this page. Various degrees of smoothness can thus be produced.



7. The paper is now finished, and comes off the machine in a roll five miles long. All that is required is to cut it into the widths required for use, and here the paper is rushing through a machine which cuts it as it travels.

Plain Answers to the Questions of the Children of the World



A dying plant is revived by water, which it takes up by osmosis

WHAT IS OSMOSIS?

OSMOSIS is the impulse or tendency of fluids to pass through a porous partition and mix with one another, or, as scientists say, to become diffused. Perhaps this can best be explained by a simple experiment we can all perform. We take an ordinary thistle funnel such as is used in chemistry, and close the mouth of it with a piece of moistened parchment paper tied firmly round the rim and sealed carefully with vaseline or paraffin.

Now we fill the bulb of the funnel with a strong solution of sugar and suspend it in a jar of water. Soon we shall find the water rising in the tube of the funnel, and if the syrup is strong the column will rise to a great height. What happens is that an exchange takes place between the two liquids—the dense solution and the water—the fluids passing through the membrane. The water passes through rapidly, diluting the syrup, while the sugar solution passes slowly into the water, and this process will continue until eventually the two solutions become of equal density.

The term osmosis is derived from a Greek word meaning pushing, or thrusting. The force which causes osmosis is known as osmotic pressure.

Osmosis is of vast importance, for it is by it that the distribution of solutions

in the bodies of all plants and animals takes place. Though the fact had been recognised the explanation was unknown till it was partly discovered by Professor J. H. Van't Hoff, the great Dutch chemist, and for this he received a Nobel prize in 1901. The explanation is highly technical and difficult, but put simply, it may be said that Van't Hoff found that osmosis is due to the activities of the molecules of the substances in solution, and that these molecules exert pressure according to the laws which govern the molecules of gases causing them to mix. The full explanation, however, is not yet known to science.

It is by osmosis that water is taken from the soil by the root-hairs of a plant. These root-hairs are not open suction tubes, working like the pipe of a pump; they are enclosed cells, and the water is taken up in exactly the same way as the strong sugar solution in the thistle funnel takes up water from the jar in which it is immersed.

Inside the cells of the root-hairs are salts in solution and organic acids, the fluid being much denser than the water or weak solution held by the soil. The weak solution in the soil passes through the cell walls into the cells, and is passed on from cell to cell right through the plant by continued osmosis.

FIRE · WIND · WATER · LIFE · MIND · SLEEP · HOW · WHY · WHERE

What Causes a Fog?

People are very careless in the way of using the word fog, and we really need a new word. There is a kind of fog which is only a dense mist, and it is really the same as a cloud, only near the Earth. Fogs are, of course, very common at sea, for the obvious reason that they are made of water, and there is plenty of water there to make them of. Such fogs are perfectly clean, and they probably do not injure our bodies at all. The real danger about them is that, at sea, they may prevent ships from seeing one another, and so they may strike each other. But the kind of fog we have in cities is a very different thing; it is mostly made of smoke, and someone has very well suggested that we should call it not fog but smog, in order to remind ourselves that it is made of smoke. In certain states of the air, especially when the air is warm enough, smoke rises high into the sky, and is blown away and does not do much harm, though wherever there is smoke there is waste. But often, when the air is cold, the smoke gathers and settles in the form of a fog. This interrupts the traffic; it makes everything dirty; it eats away the surface of most beautiful buildings; and it makes thousands of people ill. Some day men will wonder that we were so silly as to allow it.

Why does a Bicycle Keep Upright?

In answering this question we may teach ourselves the way in which we try to solve questions like this. We know that the bicycle does not keep upright when it is still, but it does so when it is in motion. The same is the case with a hoop. The more a bicycle or a hoop moves, the more surely does it tend to keep upright. There must be something, then, in the nature of motion that keeps the bicycle upright; not something in the bicycle itself, or else it would keep upright apart from its motion. Newton's first law of motion must be the answer. This says that a *moving* thing will move at a constant speed *in the same straight line* for ever, unless it is acted on by some other force. That is what happens to the bicycle or the hoop. It is a *moving* thing, set moving in a certain direction, and, according to the first law of motion, it *must* go on moving in that same line until something interferes with it, and so it keeps upright.

Why do Languages Change as Time Passes?

Every language changes, whether people like it or not. New words are made, and old ones are forgotten. The English we speak and write is very different from Shakespeare's and Chaucer's. Languages have bad periods and good periods. Everyone agrees that the English into which the Bible was translated was the best English there has ever been. These things are partly matters of fashion. Everyone who writes a language does something to make it better or worse; and everyone who reads bad English and does not mind it is encouraging people to write bad English, and so make the language worse. Also everybody who uses slang, talking of a rose as awfully sweet, as is the way of shallow talkers, is helping to destroy the beauty of our Mother tongue.

What is a Griffin?

Of all the mythological creatures portrayed in heraldry the griffin is probably the most ancient and familiar, there being words for it in both ancient Greek and Latin. In appearance it is partly lion and partly eagle, and it is generally supposed to signify strength and watchfulness; the Persians have frequently shown it in sculpture as a guardian of treasure. Griffins appear prominently on the armorial crest of the City of London, and there is a famous one in stone surmounting the Temple Bar Memorial at the western entrance to the City. It has been called the ugliest thing in London, but that description is probably better merited by Charing Cross Railway Bridge.

What is the Will-o'-the-Wisp?

There is a particular kind of gas, produced from decaying vegetable matter in marshy water, which is called marsh gas. It used to be thought that this gas gave rise to a light which, sharing in the general movements of the air, danced about and produced the Will-o'-the-wisp. It was also called by an old Latin name we often see in print (*ignis fatuus*), and another popular name was Jack-o'-lantern. For some time it was contended by chemists that marsh gas could not possibly be luminous, because it would not burn, but it is now thought that, when mixed into phosphoretted hydrogen, as it might be in marshy places, the mixture could spontaneously ignite and so appear as a dancing light.

How Does a Man Know when he has Reached the Pole?

Nowadays, by means of scientific instruments, sailors and explorers can readily calculate their position either by land or by sea, so that a man who has reached one of the Poles has to do nothing unusual to determine where he is. By calculating the latitude and longitude he can tell the exact spot at which he has arrived. The parallels of latitude are imaginary lines drawn parallel to the Equator, which is called 0, to the Pole, which is 90. Longitude, on the other hand, is calculated from what is known as the meridian of Greenwich, the Pole in this case being called 0. Therefore, when a man calculates that he has arrived at a spot whose longitude is 0 and latitude 90, he knows he is at a Pole. Whether it is the North Pole or the South can be told easily by the position of the Sun.

Can We Store Sunlight?

When light falls on the Earth it is usually changed into other things. Its power is never turned into nothing, but it is very often wasted. It is a great pity we do not try to store sunlight so that we may use it as we need it. We shall no doubt learn to do this some day. Meanwhile, the green world around us is storing sunlight. There is stored sunlight in coal. The coal is made from the bodies of plants that lived long ago. They lived by sunlight, and turned its power into the making of their own bodies. That power is still in the coal, as we find when we burn it. The light of the fire is sunlight that has long been stored in the Earth. Everyone who plants a tree is storing sunlight. Some day, when everyone becomes sensible, we shall not waste great tracts of land, as we do now, but shall use them for storing sunlight by planting trees on them. For every tree that is cut down, one should be planted somewhere or other.

Why Have Ships a Water-line?

When any ship floats in the water, the line the surface of the water makes along the ship's side is called the water-line, and the height of this line on the ship's side depends on the extent to which the ship is loaded. About half a century ago a man named Samuel Plimsoll tried to pass a Bill dealing with what used to be called "coffin-ships," because they were far too heavily loaded for safety, the cargo being

insured so that it, as often happened, they went to the bottom, though the crew lost their lives, the owner lost nothing. After a long fight, mainly due to the resistance of shipowners, Plimsoll, who was a Member of Parliament, got a law made so that a safety line has to be put on a ship's side. The ship may not be loaded to such an extent as to put that line beneath the water. It is usually known as the Plimsoll line, and must have saved thousands and thousands of lives.

Why Do Flowers Vary in Colour?

We do not know in any clear way what originally produces the different colours in different flowers. We cannot alter the colour of any particular flower to any great extent, even when we have the seed from the beginning, unless, indeed, we blanch it by growing it in a soil that has no iron. The colour of a particular flower is what it is through *heredity*—the general law that offspring resemble their parents.

This acts in a very remarkable way in some cases which are now being studied, especially in the colour of sweet peas, which vary a great deal. It may seem that these variations are just haphazard; but it is not so. The different colours occur in regular proportions, due to the way in which the laws of heredity work; and if we take seed from these flowers, and grow it, we find that these laws are still maintained in the colour of the flowers of the next generation. We know, too, that the single cell from which every plant starts contains tiny living parts that determine what colour of flowers it shall have, and what proportion of each kind of colour is to be in these flowers.

Where Does the Wind Go When it Does not Blow?

The wind is a movement in the air, a current like a current in the sea, or a current you may make in your tea when you stir it. If there is nothing to make a current in your tea, the tea lies still; and if there is nothing to make a current in the air (that is to say, a wind) the air lies still, and there is no wind. So the answer is that the wind goes nowhere when it does not blow; and what we mean by this is that the wind is not a *thing* like an orange, but is a particular *state* of the air, a state of movement. When the wind does not blow it is not because the wind has hidden itself somewhere, but simply that the air is still, which is another way of saying there is no wind. The general rule about the wind

is simply that it is the air moving from a place where the air is more dense or tightly packed to a place where it is rarer or less tightly packed.

There are changes always going on in the pressure of the air at one place as compared with another, and all these changes produce wind. If, then, we have an instrument which tells us how the pressure

of the air around us is changing, and whether it is low or high, we are able to know what sort of weather we shall have because we know how the wind will blow. In a slight breeze the moving air, which makes a wind, moves at such a rate as four or five miles an hour; say, a little faster than a good walker. In a gale the air will move as fast as an express train.

ARE ALL MACHINES BASED ON THE SAME PRINCIPLES?

We must remember that a machine is not necessarily a complicated piece of mechanism with wheels and cranks and cogs, but may be any instrument for the conversion of motion. Or, to put it more simply, a machine is an instrument by which we may change the direction and speed of a given motion. For example, a crowbar is a machine, for as we use it we change the rapid motion at the end of the long arm into the slow motion of the short arm which moves the load.

The means by which motion is transmitted for mechanical purposes are known as mechanical movements, and, though there are hundreds of these, they are really all modifications or adaptations of two motions known as *reciprocating* and *circular*, reciprocating meaning to and fro, as when a piston goes in and out of a cylinder. Circular motion is, of course, a movement round and round, as with a wheel, and the to-and-fro movement can be transformed into circular, and circular movement into the to-and-fro by means of a crank, as in a railway engine, when the piston turns the wheels.

It will be found that all mechanical movements (all machines), the most complicated as well as the simplest, are based on certain definite and unchangeable principles. An uncivilised man using a stick for a lever to turn over a rock, and a country boy turning a windlass to draw up water from a well, may not know that they are following scientific principles, but they are as scientific as the engineer who constructs a complicated weaving or printing machine.

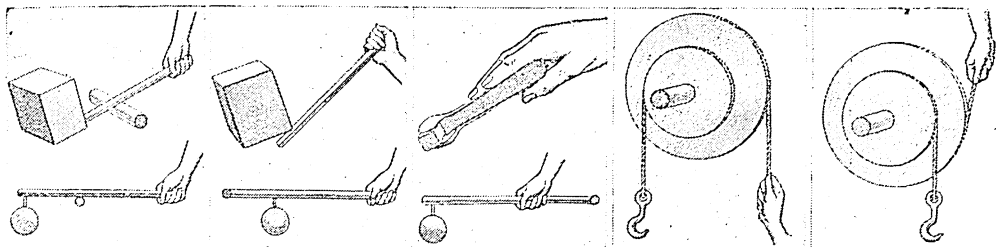
Civilised man has combined various mechanical movements and has found a multiplicity of ways of getting the same effects, each useful in particular conditions; but they are really the same principles as those used by the least civilised of men with very simple appliances. It is therefore true that all machines are based on the same principles.

We give in these pages a hundred of the most important mechanical movements used in making and working machinery, and it will be noticed that the same result can often be obtained in a variety of ways. The appliances shown in pictures 10 to 15, for instance, are all for the same purpose, that is, to raise a weight; but they do this in different ways. In picture 10 the power is doubled and the speed of the load is halved. In 11 there is an increase of power with reduced speed. In 12 the load and the power are equal. In 13 an arrangement of three blocks is shown which gives a slightly greater power than that shown in 11. In 14 we see multiple sheave blocks, the ordinary arrangement of pulleys for doing actual work with a minimum of power, as when two or three men pull a heavy safe up to a fourth-floor window.

Pictures 21 to 24 show how power is transmitted from one place or level to another, and each has its advantages in certain conditions. In 25 the speed is varied by changing the belt from one step of the pulley-wheel to another. In 26 there are four pulleys on the lower shaft, the two outer ones being loose and the two inner ones fast. The belt to the left is shown on its loose pulley, the one to the right on its fast one; a slow motion is consequently transmitted to the lower shaft. When the belt to the right is moved on to its loose pulley and the one on the left to its fast pulley, a quicker motion is transmitted because the lower wheel must keep pace with the fast small wheel above. In 27 the same effect is obtained by gearing and pulley wheels fixed to different shafts.

Pictures 63 to 65 and 69 show different ways of obtaining a slow forward movement and a quick return motion. In 63, belt pulleys drive either of two independent pinions, and speed and direction are changed by a train of gears. In 64 the required movements are obtained by automatic change in the proportions of the gears, and in 65 there is also an automatic gear change. In 69 the motions are obtained by a lever and crank disc.

100 MECHANICAL MOVEMENTS



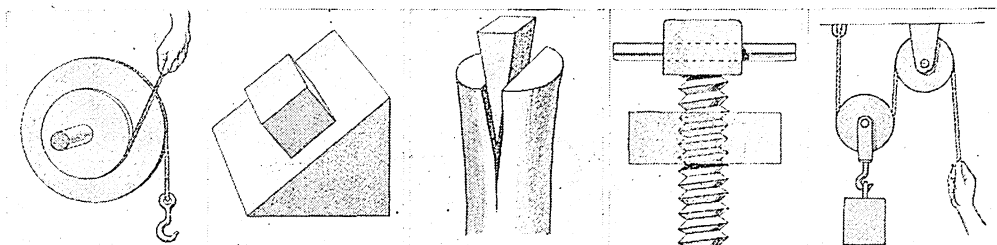
1. Lever of first order

2. Lever of second order

3. Lever of third order

4. Revolving lever, first order

5. Revolving lever, second order



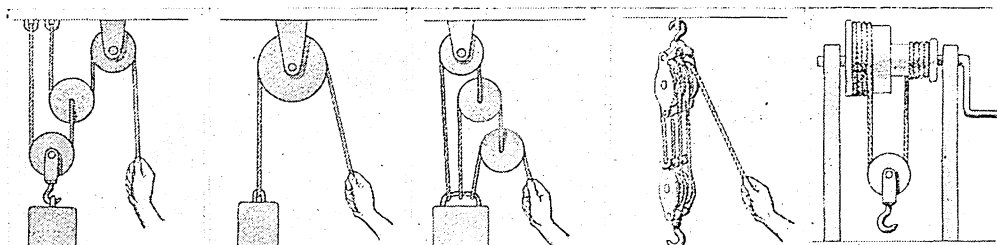
6. Revolving lever, third order

7. The inclined plane

8. Wedge, a double inclined plane

9. Screw-adaptation of inclined plane

10. Pulley of two blocks



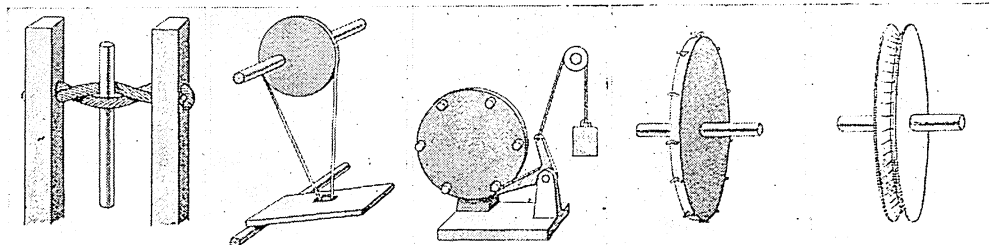
11. Pulley of three blocks

12. Pulley of one block

13. Another pulley of three blocks

14. Multiple sheave blocks

15. The Chinese windlass



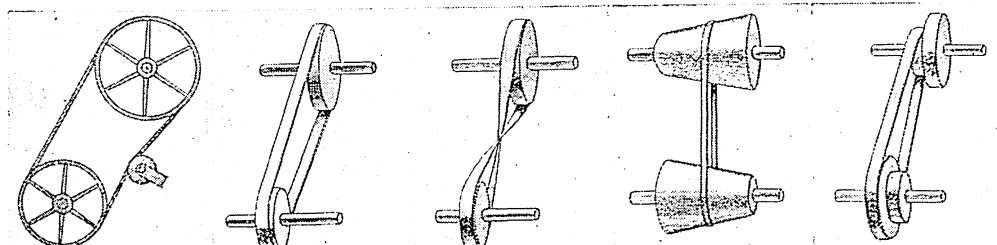
16. A rope twist lever

17. An eccentric crank

18. Jumping motion with pin wheel and bell crank

19. Rope sprocket wheel

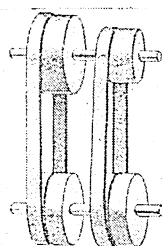
20. U-grooved wheel pulley



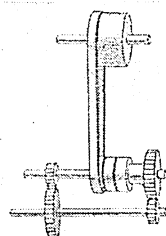
21. Rope transmission; 22. Belt transmission, 23. Cross-belt to drive one wheel drives another pulleys revolve together pulleys opposite ways

24. Cone pulleys, speed varied by shifting belt

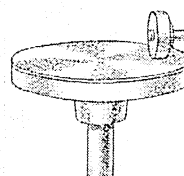
25. Two-speed step pulleys



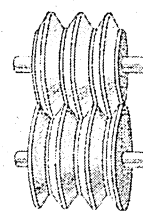
26. Two speed pulleys



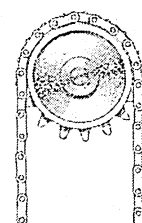
27. Two speed gear



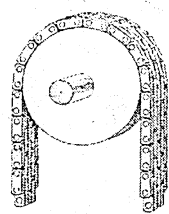
28. Friction gear



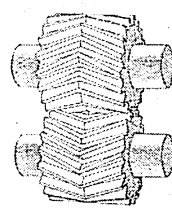
29. Grooved friction gear



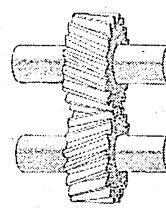
30. Sprocket wheel and chain



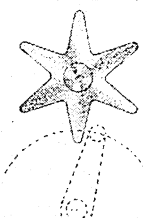
31. Link belt and pulley



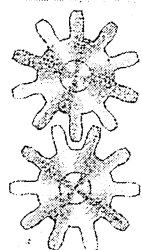
32. V-toothed gearing



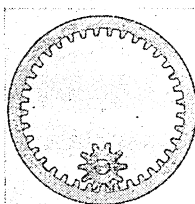
33. Oblique-toothed gearing



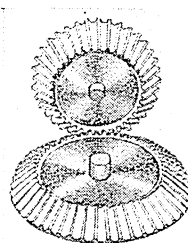
34. Star wheel



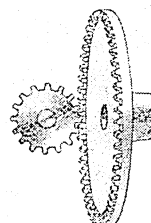
35. Star wheel gear



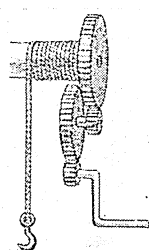
36. Internal spur gear



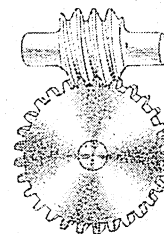
37. Bevel gears



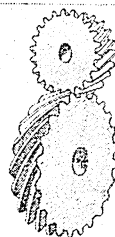
38. Crown wheel gear



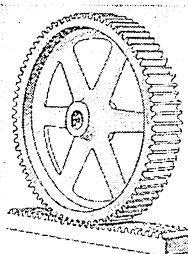
39. Gear train



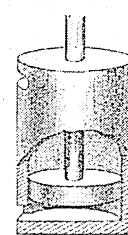
40. Worm gear



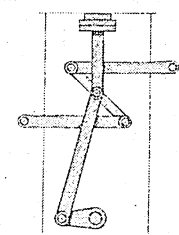
41. Spiral gear



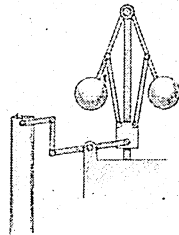
42. Rack and wheel



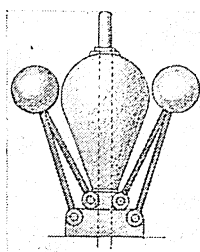
43. Piston and cylinder



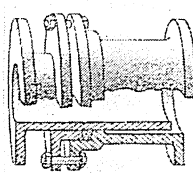
44. Parallel motion



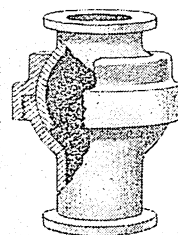
45. Governor for varying steam supply



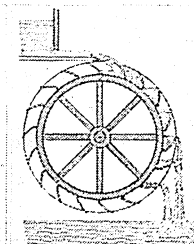
46. Compensating governor



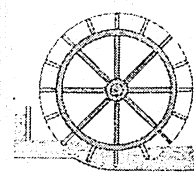
47. Flanged expansion joint



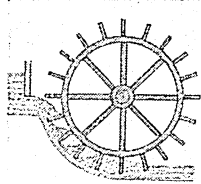
48. Flexible steam joint



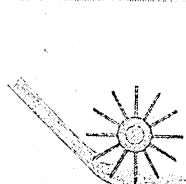
49. Overshot water wheel



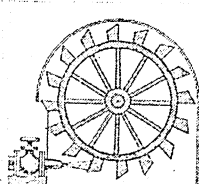
50. Undershot water wheel



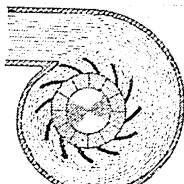
51. Breast water wheel



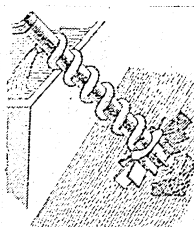
52. Flutter wheel



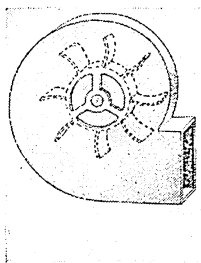
53. Pelton water wheel



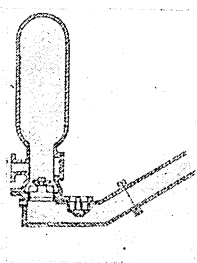
54. Water turbine



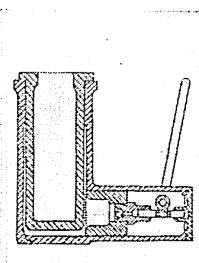
55. Archimedean screw



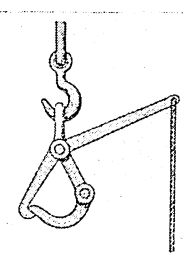
56. Fan blower



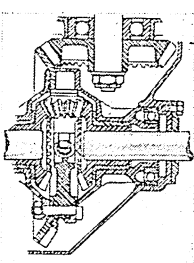
57. Hydraulic ram



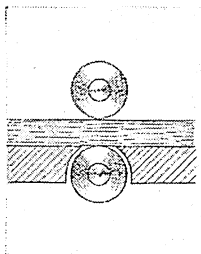
58. Hydraulic press



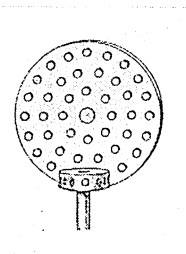
59. Slip hook



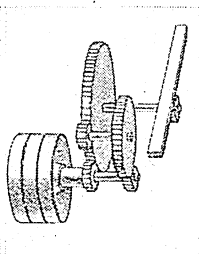
60. Differential gear



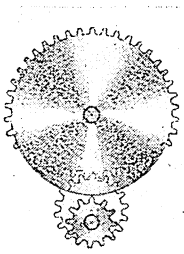
61. Adjustable feed rolls



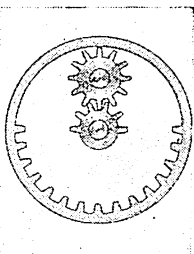
62. Pin wheel and slotted pinion



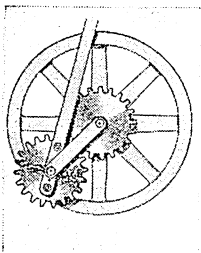
63. Slow forward and quick return motion



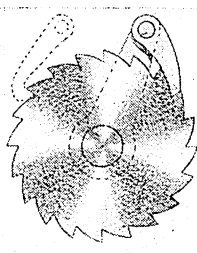
64. Slow forward and quick return motion



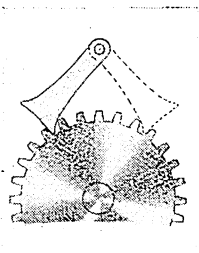
65. Slow forward and quick return motion



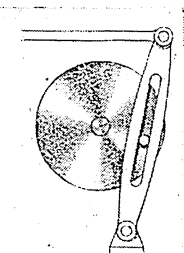
66. Sun and planet crank motion



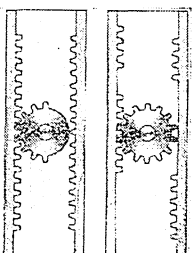
67. Ratchet wheel and pawl



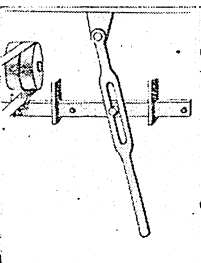
68. Reversible pawl



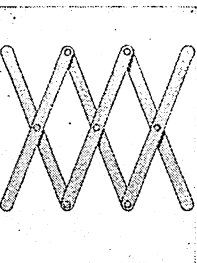
69. Slow forward and quick return motion



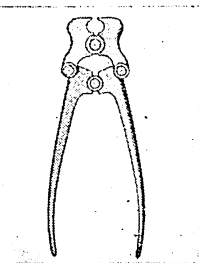
70. Regular and irregular reversals



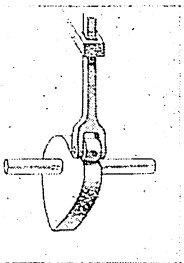
71. Rectilinear motion by a lever



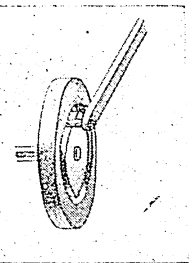
72. Lazy tongs used for gates and guards



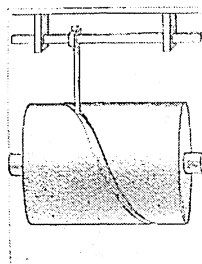
73. Example of a toggle joint
6351



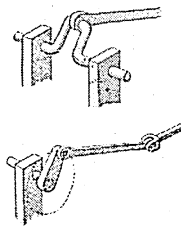
74. Heart-shaped cam for reciprocating movement



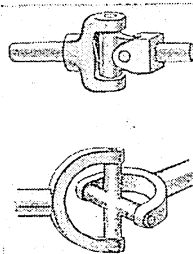
75. Cam with groove to give variable movement



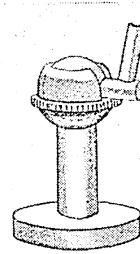
76. Grooved cylinder cam



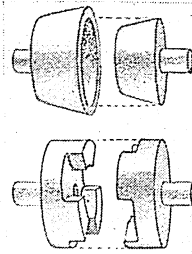
77. Types of crank motion



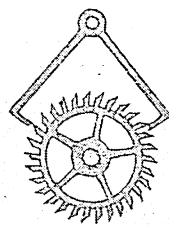
78. Angle joint and universal coupling



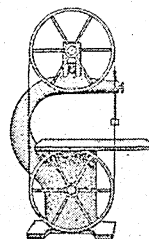
79. Ball and socket joint



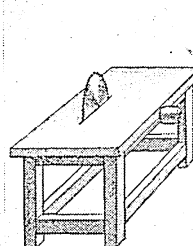
80. Two forms of clutch



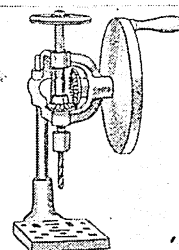
81. Dead beat escapement



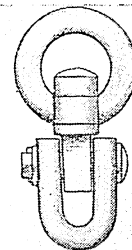
82. Common type of band saw



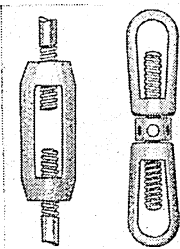
83. Usual type of circular saw



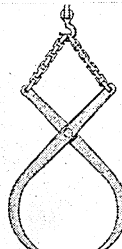
84. Hand-drilling machine



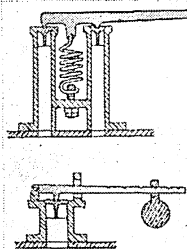
85. Swivel shackle



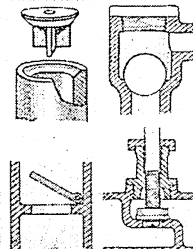
86. Types of turnbuckles



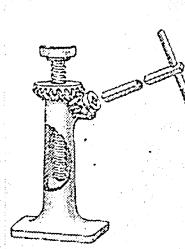
87. Grip tongs



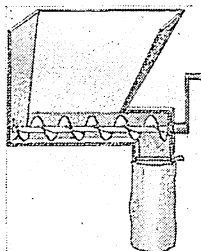
88. Safety valves



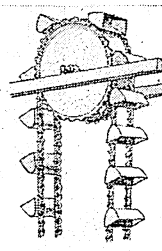
89. Valves for water and steam



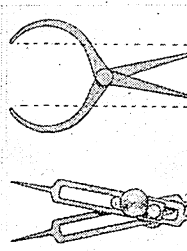
90. Lifting jack



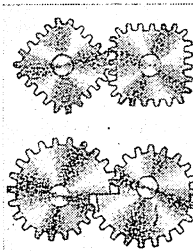
91. Conveyer screw



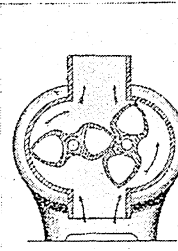
92. Link belt bucket elevator



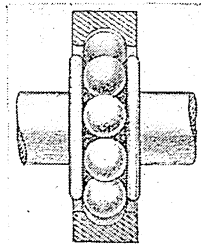
93. Combination callipers; proportional dividers



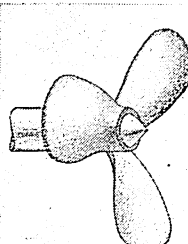
94. Gears of variable speed



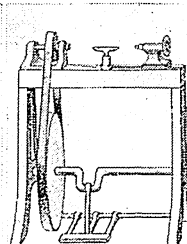
95. Blower with two fans



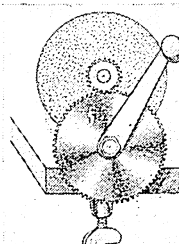
96. Example of ball bearing



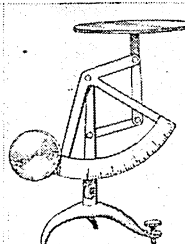
97. Three blade screw propeller



98. Lathe for making circular objects
6352



99. Hand emery grinder



100. Lever scales for weighing

What is the Alfred Jewel?

The Alfred Jewel, which can be seen at the Ashmolean Museum at Oxford, is one of the most interesting and valuable relics of Anglo-Saxon times. It is an oval ornament of enamelled gold, and was found during excavations in 1693 near Athelney Abbey in Somersetshire, probably quite close to the spot where Alfred took refuge from the Danes 800 years before. The portrait it bears is probably that of the king, as the Anglo-Saxon words surrounding it mean *Alfred had me wrought*. Its fine workmanship, and the place in which it was found, also increase the likelihood of its having actually belonged to Alfred.

What is the Deepest Hole in the Earth?

Many of the deepest holes in the Earth are gold-mines, and in the famous St. John del Rey mine in Brazil the miners are now working at a depth of 6700 feet, where the most intense heat is encountered, and an elaborate cooling plant has had to be installed to allow work to be carried on, air being continually forced down the shaft by means of gigantic fans. The St. John del Rey, however, is quite a long way from being the deepest mine, as the United States have one 7500 feet deep in West Virginia. At the bottom of this a temperature of 168 degrees Fahrenheit has been registered.

What is a Vitamin?

Vitamins are small parts of the food we eat, but are so small and so obscure that till 1924, twelve years after the first was discovered, no one was able to extract a vitamin from any food substance. Roughly they are three in number and may be remembered by the food stuffs with which they are associated. The first is present in certain fats, particularly in cod-liver oil, butter, and egg yolk, and it is also in green leaves. The second is present in the seeds of plants, egg yolk, yeast, and in many fruits and vegetables. The third is in most juicy fruits and vegetables. Another name for the vitamins is accessory food-factors, and by that is meant that unless foods have one or more of these factors or vitamins they will not actually feed those who eat them. However much food without vitamin is eaten the result is a kind of starvation which renders men or other animals liable to disease. The reason assigned is that in some way the vitamins act as agents to split up the food so that the body can assimilate it.

Where do the Colours come from in a Stagnant Pool?

What happens when water stagnates is that various forms of life grow on its surface. Pure water alone will not support life; there must be some other things in the water, and perhaps a fatty or oily layer on the surface of it, before these things—mainly microbes—will grow. Their growth covers the surface of the water with very thin layers of matter from which the light is reflected to our eyes when we look at it. But it happens, as in many other cases, such as a soap-bubble or mother-of-pearl, that the light is partly broken up as it is reflected from these thin layers of stuff, or as it passes through them if we were to see the water from below; and so the colours are produced. The reason is that the waves of light, as they return, some from one layer of the surface, some from another, interfere with each other, and the proper name for this is the *interference of light*.

What does Bolshevik Mean?

The name Bolshevik for the Communists of Russia had its beginning in a rather curious way. For a long time before the Revolution Russia had a strong Socialistic party, split up into three distinct branches: social democrats, social revolutionaries, and extremists. Gradually the extremists gained the upper hand, till, at a Socialist conference in 1905, they succeeded in becoming a majority, the Russian word for which is much the same as the word Bolshevik. A Bolshevik, therefore, literally means a *majority Socialist*, while, in the same way, the minority (or moderate) Socialists are known as Mensheviks.

Why is Granny's Hair Grey?

The colour of the hair depends on the quantity of colouring matter it contains. That is to say, hair containing a great deal of colouring matter, or pigment, as it is called, is dark; hair containing very little is light. Now, the production of this colouring material depends on the whole body being in a good state of health, and able to perform all its functions, and it is controlled to a very large extent by the nervous system. If anything happens to go wrong with this control, either as the result of disease or the wearing out of nerve power in old age, the pigment gradually ceases to be produced, and the hair becomes grey, and then quite white. When it is white there is no pigment in it.

Why are the Names of Plants Written in Latin ?

Latin is now what we call a dead language—that is to say, no living nation speaks Latin, though one-third of English is really Latin. The time was when Latin was spoken by the most important people then living on the face of the Earth, and they had names for many chemicals and plants, many of which names we use today. But, long after the downfall of Rome, Latin remained the language of scholars; it was the one language known to all learned men all over the civilised world; they always wrote their books in it, and lectures were always delivered in Latin. It was thus possible for an Italian, shall we say, to come to England and lecture to the Englishman at Oxford in a language which was neither his own nor theirs, but the common tongue of the learned.

So it naturally came about that when the great Swede Linnaeus began to name and classify plants, he gave them Latin names. The convenience of Latin for such purposes is as great now as ever it was.

Why does the Face Change When We Think Hard ?

Underneath the skin of the face is a great number of small but wonderful muscles. These have various uses, such as to open and shut the mouth, raise the eyebrows, and so on, but they are all governed by a single pair of nerves which come from the brain, and which are called the facial nerves, one for each side of the face. These nerves are closely connected with the brain, and so it is that almost everything which happens in the brain affects them, and may show its signs in the face by movements of the muscles which these nerves control. It is not only when we think, but also when we feel, that the face changes. But it is possible in some degree for us to control the movements of our faces, so that, for instance, we may look happy when we feel sad.

Grown-up people may learn to control the movements of the face, but this is largely a matter of habit. People's faces do not tell nearly so much in England as, for instance, they do in Italy, where people allow their faces to show what they feel and think, just as a child does. When a man's face expresses his thoughts and feelings, we say that it is expressive, and it is rather nice to meet someone whose face is not like a mask that cannot move.

What is a Totem Pole ?

Among many primitive peoples it is the custom for each tribe or family to adopt some object from Nature as their special symbol, or totem. This totem may be an animal or plant, or a carving in wood or stone, and is supposed to be helpful to the tribe it represents. Tribes which have an animal totem will never kill that special animal, while those that have adopted a plant as their symbol abstain from eating others of the same species. Poles surmounted by grotesque carvings are often set near the encampments of North American Indians as totems, while among the aborigines of Australia totemism is almost universal.

What is the Salton Sea ?

The Salton Sea is a great inland water formed when the Colorado River changed its course. In a month or two it grew to be 45 miles long with an average of 15 miles wide. After the sea had been formed pelicans began to arrive in thousands, and used the islands which had been left in the sea as nesting-places. The birds, in turn, brought fish in their great pouches, and some of these, escaping into the sea, multiplied so rapidly that in a year or two a great fishing industry grew up, and now the authorities, by means of channels from the Colorado River, feed the sea to prevent it from drying up. The fishing industry was regarded as sufficiently important for this expensive step to be taken.

Why does the Fountain Play ?

The puzzle about the fountain is that the water comes upwards, though we know that water always tries to fall; it falls because the Earth pulls it. Now, something must be pushing the water up more than the Earth is pulling it down, and the question is what? The answer is that the water in the fountain is being pressed upon at the other end, generally by water in a cistern or a reservoir at a higher level than the fountain. Water, like all liquids, tries to find its own level, and in doing so, if there is an opening like that of the fountain before it has reached its level, it naturally rushes out, the height of the jet depending on the height of the reservoir above the fountain outlet. Sometimes a fountain is worked by a force pump, when it is the pressure of a piston that drives the water up in the same way as we force water out of a syringe.

How do such Big Flowers Come out of such Small Seeds?

This question is about something more wonderful, perhaps, than you think, for the greater part of most seeds is not really necessary at all, but is just a supply of food material, and is not alive. The real seed from which the biggest oak springs is very much smaller than the acorn. The wonderful thing is that the seed in its tiny space is made in such a way, and with such power, that it is able to turn the food it gets from the air and the ground into the very kind of tree or flower that its parents were. That is the mystery which hundreds of men are studying at this hour. It would not be so difficult if, when we see the seed under the microscope, we could see a perfect little plant, and if all it had to do was just to get big; but we see nothing like a plant in the seed.

Why Cannot we Feel Air-Waves with our Hands?

This is simply a question of the delicacy of the sense of touch. Our hands can and do feel air-waves of certain rates and sizes. When we fan ourselves we feel air-waves, and we also feel them when someone suddenly shuts a door, or when we stand on a station platform and an express train whizzes by. When the air-waves are much smaller and quicker we cannot feel them with our hands, but we feel them with our ears, and then we call them sounds. Some of the largest and slowest air-waves that can just be heard by our ears, as a very deep, faint, low sort of boom, can also be just felt by our hands. This, of course, depends on the limits of hearing in the person in question, for some people can hear much lower notes—that is to say, much slower waves—than others.

Are New Words Made for New Things?

Yes; new words are made for new things; and so it is that language is changed more quickly in countries where people write and read a great deal, and where new things are made and done. Then people always want to save time in speaking and reading and writing, so they get shorter ways of saying things, and the tendency of all words is to get shorter. French shows this very much; for instance, in *père*, the French word for father, they have dropped the *t* of *pater* altogether. We have done the same with *I*, while the Germans still say *Ich* and the Romans actually took the trouble of saying

two syllables, *Ego*. Then the Romans said *est* for *is*, and the Germans still say *ist*. The French keep the letters *est*, but they only pronounce the first. The modern Italians have not only stopped pronouncing the *st*, but have stopped writing them, and their word for *is* is simply *e*. But if you spent your whole life collecting cases like this you would not come to the end.

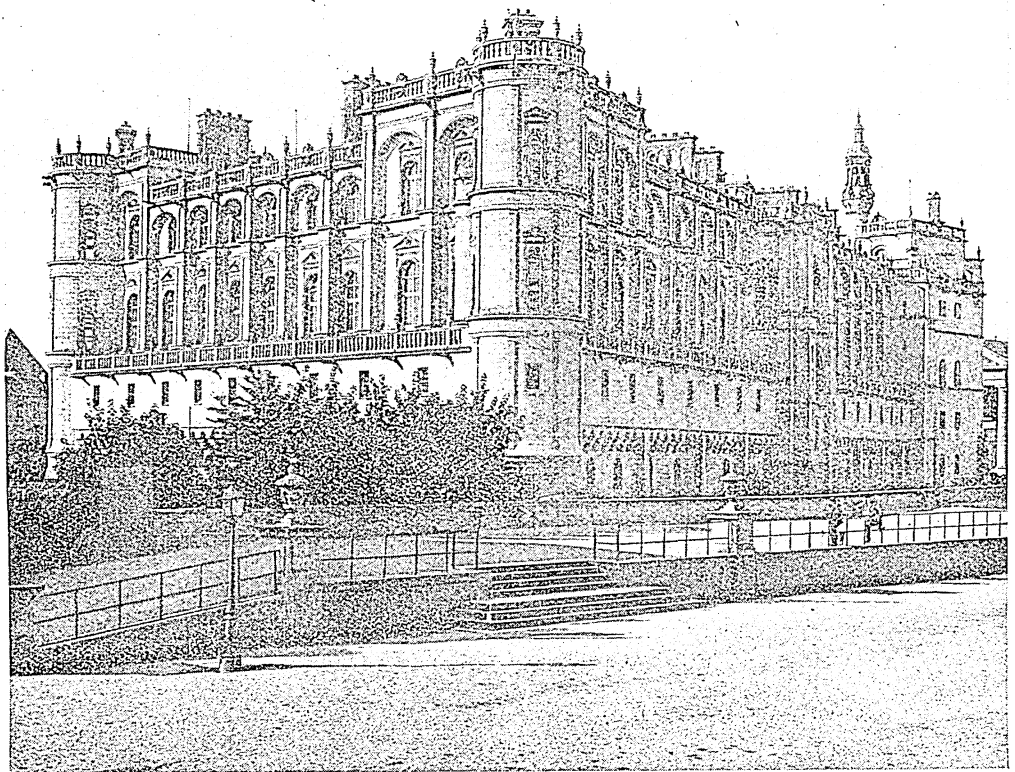
Why is it the Sea Never Gets any Bigger?

This is a question about which men have always wondered. Thoughtful children and grown-up people will be asking these questions again in a thousand years. It was asked and answered by the Hebrew preacher long years ago (Ecclesiastes i. 7): "All the rivers run into the sea; yet the sea is not full; unto the place from whence the rivers come, thither they return again." So we see that this question is answered in the Bible. What happens is that the power of the Sun draws up some of the water from the sea, and it is poured back on the land in the form of rain, which makes the rivers. Besides this, in many parts of the world the sea *does* get larger, because it wears away the land; but in other parts the land extends and the sea gets smaller.

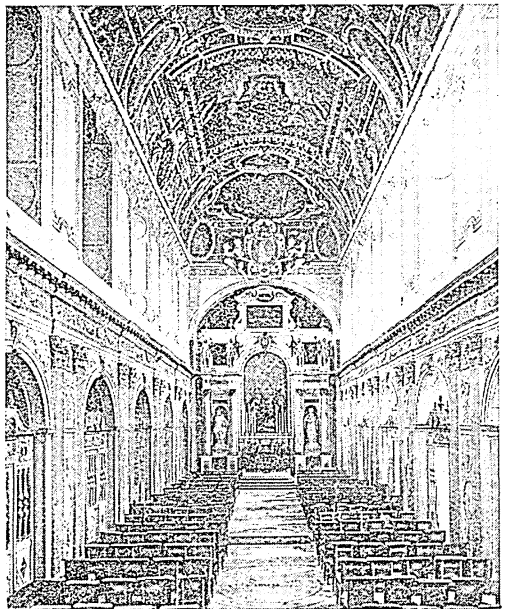
What were the Seven Hills of Rome?

Ancient Rome was called the City of the Seven Hills because it was built in the centre of seven heights, whose names were the Aventine, the Palatine, the Capitol, the Esquiline, the Quirinal, Viminal, and Caelian. The Aventine hill has remained famous through history for a rising of the people long ago. Irritated by new taxes levied by the patricians, the plebeians (the common people) made up their minds to revolt, and so retired in crowds to the Aventine. The city then dispatched Menenius Agrippa, a man famous for his eloquence to interview the rebels, and he simply recalled them by repeating the fable of the "Stomach and the Limbs." Tired of working for the good of the stomach alone, the limbs one day decided to remain idle. They were not long, however, in finding that they were harming themselves by refusing their help to the stomach, for, deprived of all nourishing food they grew very weak, and understood how urgent it was to make peace. "Then," concluded Agrippa, "patricians and plebeians must form one body strengthened by the activity of all its members." And the people, converted, thronged back to Rome.

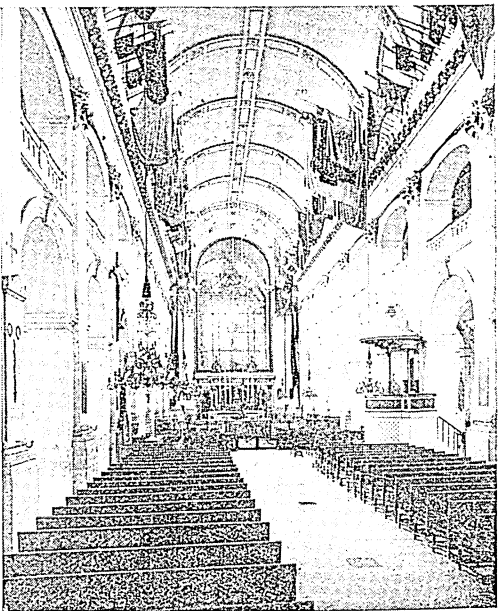
THREE BEAUTIFUL BUILDINGS OF FRANCE



THE SIXTEENTH-CENTURY CHATEAU AT SAINT-GERMAIN



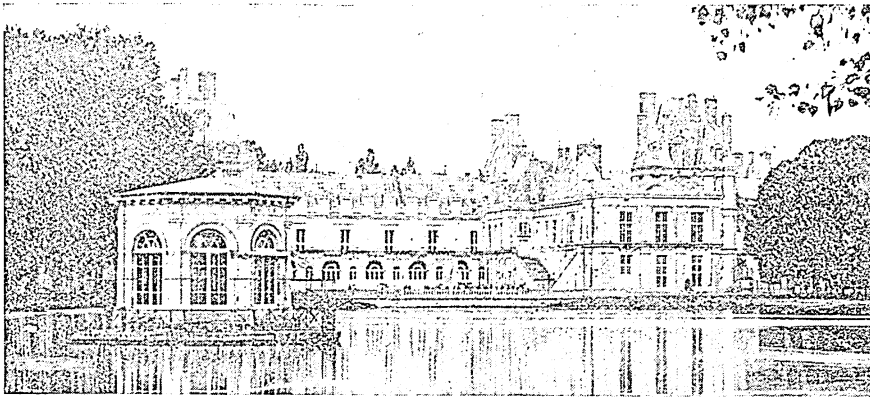
THE CHAPEL, FONTAINEBLEAU



THE CHURCH OF LES INVALIDES IN PARIS

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The Story of the Beautiful Things in the Treasure-House of the World



The beautiful palace of Fontainebleau

THE RENAISSANCE IN EUROPE AND THE CHATEAUX OF FRANCE

THE Gothic builders of France were not only called on to erect the cathedrals which are the country's glory and pride; they set up a number of castles and private palaces. These are generally known as chateaux, and they passed through the same developments as the English castle.

The earliest were built by powerful princes and kings, the only people possessed of great wealth. When the feudal system waned and private individuals, through industry and trade, grew to power, some very fine houses were built for them. As in the case of the English halls, varying periods have set their mark on the fabric of these great homes of France.

Only one who knows a good deal and can distinguish between what is original in a style and what is a recent restoration, may recognise the work of the early French builders. The period of the Revolution was an era of ruthless destruction of beautiful things. Time had already signed the death warrant of much that was finer in appearance than in construction; and between the work of these two destroyers many great buildings have been lost.

One of the earliest and most famous was carefully restored by Viollet-le-Duc, a

clever architect of nineteenth-century France, and is now open to the public. This is the Chateau de Pierrefonds near Compiègne, in northern France. It was built by Louis of Orleans about 1396 on a rocky height above the village, and gives us an excellent idea of what a French medieval castle was like.

Pierrefonds is foursquare in shape, surrounded by an immense battlemented wall 20 feet thick, which rises sheer from the rock; eight loop-holed towers, 115 feet high, are built into the wall, one at each corner and in the centre of each side. Within this enormous mass of protecting masonry lie the buildings of the castle, grouped round a courtyard.

For two hundred years Pierrefonds was a powerful fortress. We can imagine the castle, with its moat and drawbridge and fortified towers, rearing itself above the surrounding country, a menace to enemy forces, a symbol of pride and power. Early in the seventeenth century it was dismantled. During the troubles of the Revolution it was sold, and bought later by Napoleon. Pierrefonds now belongs to the French nation.

The walled towns of France give us another glimpse of medieval Europe. We can trace the course of the country's

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history by the ruins of monstrous walls that still stand around certain towns. The ramparts of Dinan and St. Malo in the north draw the eye and mind of the holiday maker into another world. In the south of France are three of the most remarkable walled towns in Europe: Avignon, Carcassonne, and Aigues Mortes.

THE HISTORIC OLD BRIDGE ACROSS THE RHONE AT AVIGNON

Within the ramparts and towers that girdle Avignon rises the magnificent palace built by the popes during their residence in France from 1309 to 1377. Part of the famous bridge across the Rhone, the Pont d'Avignon, still stands. It is a most wonderful piece of architecture, first built about 1177 by the Guild of Bridge Builders, to connect the old town with the new. Built on to one of the piers, halfway across the river, stands the little chapel of Bénézet, the patron saint of the bridge. One of the most popular children's songs in France is about this wonderful structure:

Sur le pont d'Avignon
Tout le monde y danse en rond.

The sun washes the cliff-like, battlemented walls of Avignon very happily now, and the townsfolk still act their mid-summer plays outside the old town, with the ramparts for background. But in the stormy days of Europe Avignon was much more a power than a spectacle, and many a company of soldiers marched, with banners and bugles, across the lovely old Pont d'Avignon, never to return.

We can see more of the grimness of this forgotten architecture in the walls of Carcassonne and Aigues Mortes. A walk round the ramparts is, to a thoughtful person, a revelation of a lost art in building. To a casual sightseer Carcassonne might be better without its "dull old walls." Those who are held by the magic of the past are profoundly thankful that these ramparts and towers still exist, with their mysterious inner galleries and staircases and their terrible battlemented gateways. They mark the place in Europe's story where Time turned the page for ever, and a new chapter began.

HOUSES THAT CHANGED THEIR CHARACTER THROUGH THE CENTURIES

There are many fortress castles in France which threw off their warlikeness in succeeding centuries and retained nothing of the ancient chateau but its name. The most beautiful are in the

Loire district, and they have kept some exquisite features of early French domestic architecture, such as the ornamented gateways and the spiral staircases.

The Chateau de Josselin in Brittany dates from the twelfth century, but was rebuilt about four hundred years later in the most picturesque period of the French development. To this period also (early sixteenth century) belong the Chateau de Bury, with its large square court, its many-towered entrance. This chateau is typical of many country houses of the transition period, when Gothic was changing into Renaissance. Another famous building is the Chateau de Chambord on the Loire. It is massed round two rectangular courts, one within another. All that was rich and elegant of the period in design, masonry, and sculpture, found its way to this chateau. Its carved turrets, chimneys and dormer roofs cluster behind the immense outer walls and barricading towers. At Chambord is one of the corkscrew staircases beloved in this period. It is a curious double stair, and is so constructed that people can ascend and descend at the same time without being visible to each other.

ONE OF THE MOST FAMOUS COUNTRY PALACES IN THE WORLD

Other well-known country houses are the chateaux of Chenonceaux, Azay-le-Rideau, St. Germain-en-Laye. The Luxembourg was built, a little later, for Marie Medici, the wife of Henry the Fourth, by De Brosse. This is different from other such buildings because Marie wanted to pretend that, living in Paris, she had a home something like the Medici palace in Florence. Hence the grand, Tuscan air of the Luxembourg. A little later still came buildings like the Chateau de Maisons-Laffitte, country houses where a gentleman could receive his guests in state.

Among all these the Chateau de Blois stands out as one of the most famous country palaces in the world. Its various buildings are grouped round an irregular courtyard, and show where the builders of the thirteenth, fifteenth, sixteenth, and seventeenth century were employed. It has dormer windows with lovely carved roofs; elegant cornices run along the façades. Here Italian art most curiously mixes with Gothic, after the fantastic shapes of the early Renaissance, and we get the cold stateliness of its full expression. Inside, the fireplaces, panellings, wood

THE RENAISSANCE IN EUROPE

carvings, statuary, show the treasures of a country rich in art.

The most famous details of Blois are the entrance built for Louis the Twelfth, and the staircase, designed, it is said, by Leonardo da Vinci for Francis the First. The staircase winds up through a pentagonal tower which projects from the face of the wall. The tower is open at each storey, and the stair's marvellous repeating curves are visible from the courtyard.

Many kings and queens, princes and courtiers lived at Blois. It is one of the places most charged with the romance of French history, reminding us in this of parts of the Tower of London and Kenilworth. The salamander, the badge of Francis the First, and the hedgehog of Louis the Twelfth, appear and reappear in the sculptured shapes on the walls, as if to say, "Look at me. Here, four hundred years ago, a great king laid his mark." Catherine Medici haunts part of Blois. Her apartments are truly royal, from the great bedchamber where she died in 1589 to the magnificent library with its 250 wall panels, all differently carved.

Another type of dwelling arose in the Gothic years in France, during the period when merchant princes and private individuals built what we should call town houses, and they called *hôtels*. One of the finest in Europe is the Hôtel Cluny in Paris, now a museum. It was the town house of the Abbots of Cluny, and stands as a fine specimen of late Gothic architec-

ture in France. Other famous buildings are the Hôtel de Bourgtheroulde in Rouen, Hôtel de Sully in Paris, Hôtel de Sens, the House of Jacques Cœur in Bourges, the house of Agnes Sorel in Orleans.

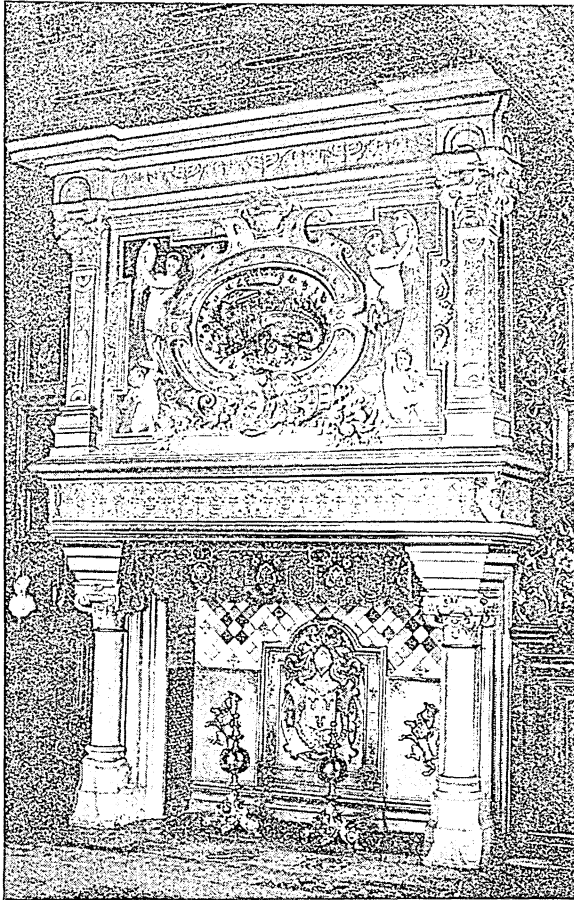
To this period also belong the magnificent municipal halls that mark the rising of a town's wealth and strength. Among them are the Hôtel de Ville (Town Hall) of Arras, of Compiègne, Bourges, Dreux, St. Quentin. Then there are the Palais de

Justice (Law Courts) of Rouen, Beauvais; beautiful monuments of a forgotten architecture like the Maison-Dieu or Hôtel-Dieu (hospital) at Beaune. There have been many later municipal buildings set up, such as the Hôtel de Ville at Lyons, an ornate Renaissance structure, but nothing will ever bring back to France the beauty, the "other world" quality, of the Gothic domestic and municipal buildings.

The Renaissance was brought to Paris by the first king of a consolidated France, Francis the First, who reigned from 1515 to 1547. The country had just shaken and

strengthened herself after her upheavals and disruptions and upsetting periods like the English wars. Francis the First ushered in a new era. He loved art and letters, had a brilliant court, and set an example to his courtiers in building and in cherishing beautiful things.

"France learned from Italy the lesson of Humanism; the readiest of the pupils was Francis the First himself." Behind the king, influencing him, helping him,



A BEAUTIFUL MANTELPIECE IN THE CHATEAU OF AZAY-LE-RIDEAU

was that wonderful woman, his sister, Margaret of Navarre.

A great army of Italian artists and architects came and settled in Paris. The first mood of the Renaissance showed in the grafting of Italian details on the French Gothic. The severe, classical lines of Italian Renaissance work were long in appearing—about a hundred years. The northern French clung to the pointed skyline of the Gothic style they loved. As in Italy, the Renaissance came more fully to growth in the parts where Gothic architecture had never been deeply rooted; where the old Romanesque had lingered the Renaissance blossomed most freely.

THE SPLENDID MONUMENT TO THE ENTHUSIASM OF A KING

The favourite home of Francis the First was the Chateau of Fontainebleau which he built just outside Paris. Here a kind of school of art and architecture foregathered, with artists and architects like Primaticcio, Philibert de l'Orme, Jean Bullant, Pierre Lescot, to the fore.

Fontainebleau will be remembered for ever as a monument to the enthusiasm of Francis the First, who caused it to be built, took marvellous pleasure therein, so that he sojourned there for the most part, and enriched it with all sorts of commodities, with galleries, halls, chambers, bathrooms . . . the whole embellished with all kinds of histories, both painted and in relief, done by the most renowned masters the king could collect in France, and in Italy. . . . And in short, all that the king could find that was excellent, was for his Fontainebleau.

In spite of all this concentrated interest, Fontainebleau as a chateau is not nearly so fine as Blois or Chambord. Its interest lies more in the superb lay-out of the grounds, the formal gardens, terraces, and lakes, and in the details of the buildings: the porticoes, staircases, and marvellous internal decoration by artists like Benvenuto Cellini and Primaticcio. The chateau was originally designed by Le Breton. Vignola and Serlio added extensions later which were admirable in themselves but marred the harmony of the whole.

THE EARLY FRENCH ARCHITECTURE OF THE RENAISSANCE

The period of the Fontainebleau school marks the beginning of the real French architecture of the Renaissance, and also marks the end of the happy-go-lucky style of building which, adding line on line

and stone on stone, had produced the medieval treasures of France. The geniuses of old France had been the master masons, who, under their patrons' orders, builded as they liked.

The life and work of Philibert de l'Orme marks the cleavage between the old and the new. He was fully aware that the old genius of the master builders was gone; that the new style of buildings coming with the Renaissance needed another kind of knowledge, of technique. After De l'Orme, architects, as we understand them, working to plan, to measured drawings, became the builders of France.

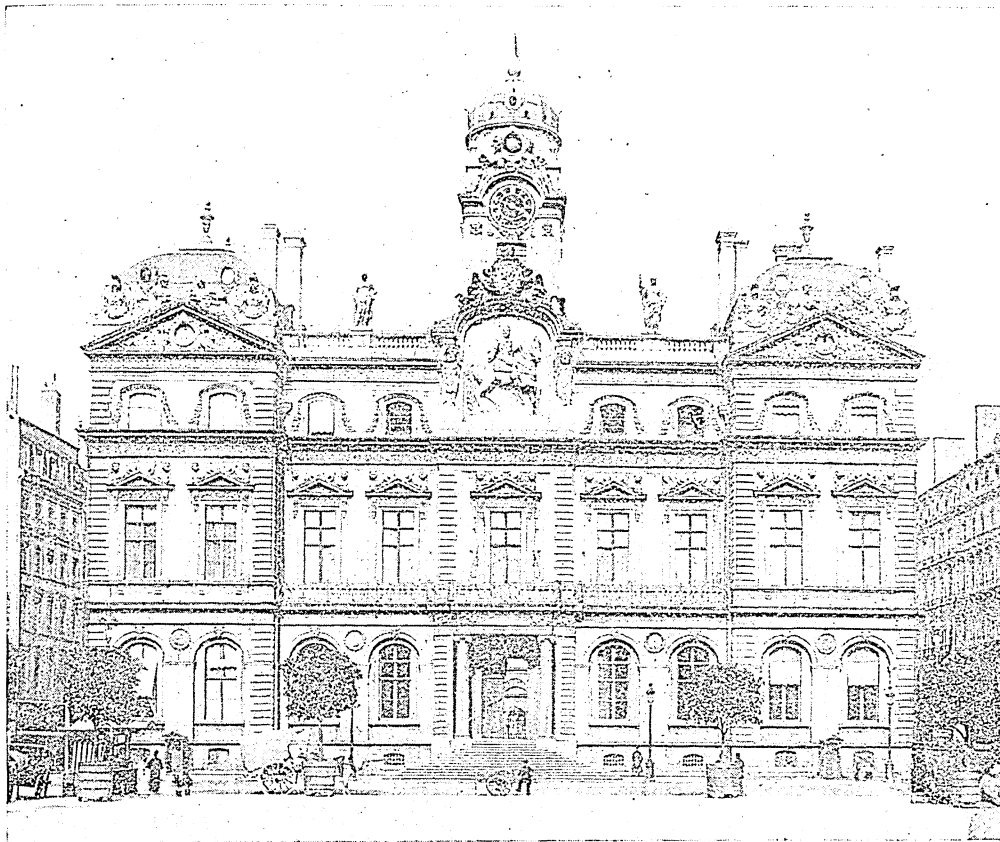
It has been said that the art in which France has always rendered her most brilliant service to the world is the art of architecture. In the Palais du Louvre in Paris, known the world over now as The Louvre, we can see the development of this art. The Palace, rebuilt on the site of an older palace, was begun in the reign of Francis the First; it has been completed within the memory of our grandfathers. Thus some four hundred years and their concentrated genius have gone to the building and adorning of this pile, which is the masterpiece of Renaissance architecture in France.

THE AMAZING HOUSE WHICH WAS TO COVER FORTY-FIVE ACRES

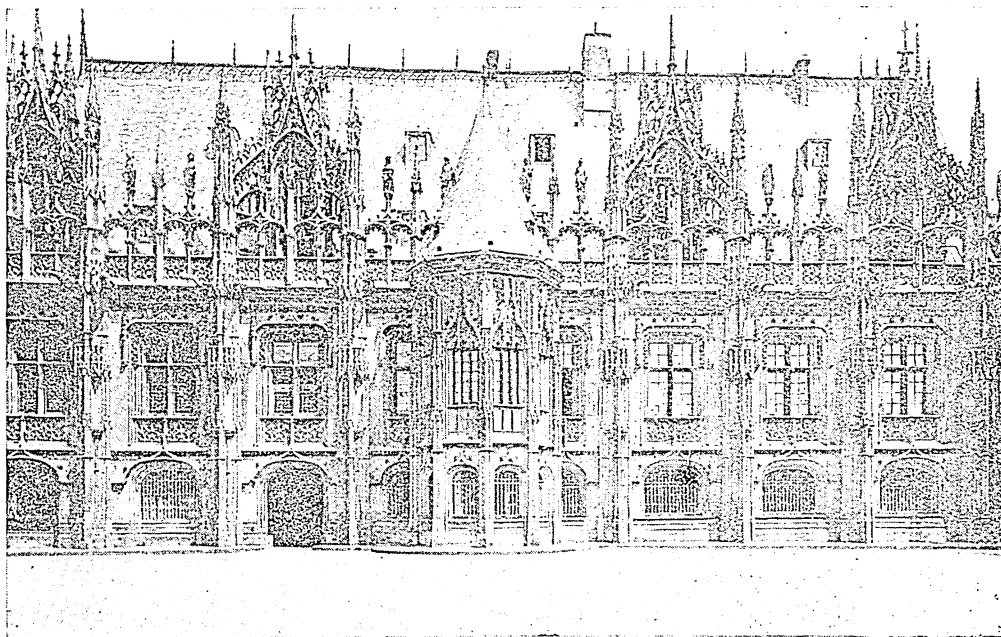
The Louvre, together with the palace of the Tuileries, to which it was long intended that the Louvre should be joined, by means of a gallery, made together a truly imposing royal residence, covering forty-five acres. Even without the Tuileries—which was destroyed in 1871 by the Paris Communists—the Louvre stands as a stupendous piece of architecture, with its various pavilions and its courts.

When Pierre Lescot began, at the orders of Francis the First, a new palace which should take the place of the Gothic Louvre of his forbears, he was doing more for the Paris of today than he could possibly know. His work was in the early Renaissance spirit and of a beautiful dignity; the rest of the architects, who followed his lead, worked naturally according to the ideas of their own period, but seemed to agree to depart as little as possible from the ideals of Lescot. Jean Goujon, the sculptor, made the decorations for Lescot's façade; his labours and his genius are made for ever memorable in "Jean Goujon's door." Catherine Medici carried on Lescot's original idea, and planned

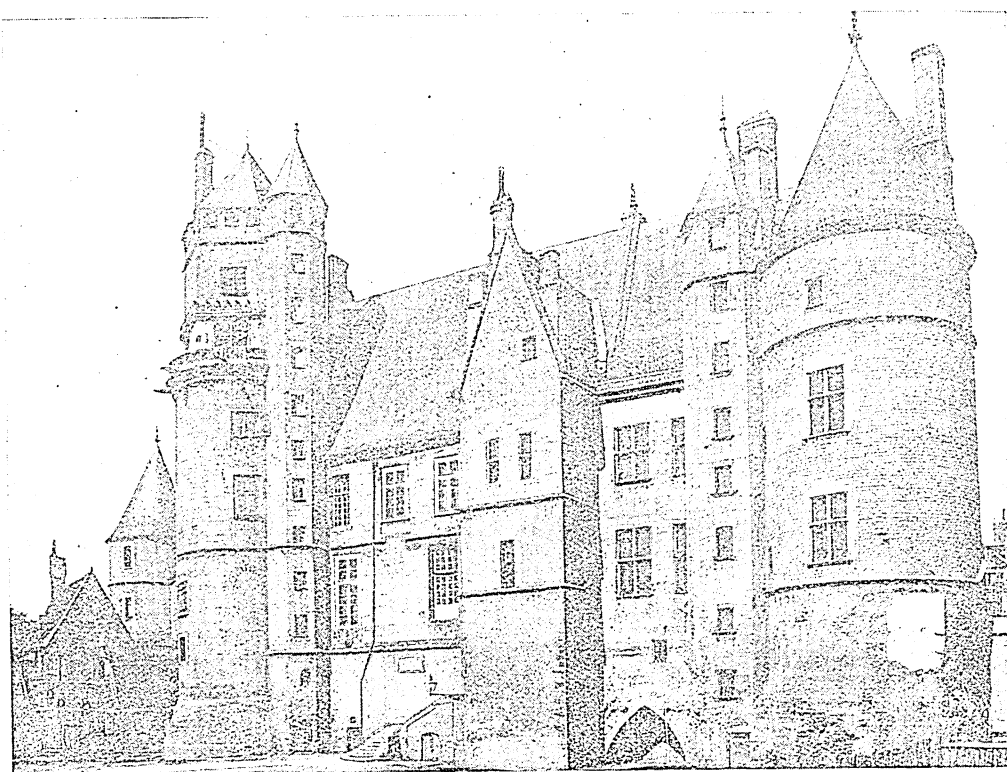
BUILDINGS OF WESTERN EUROPE



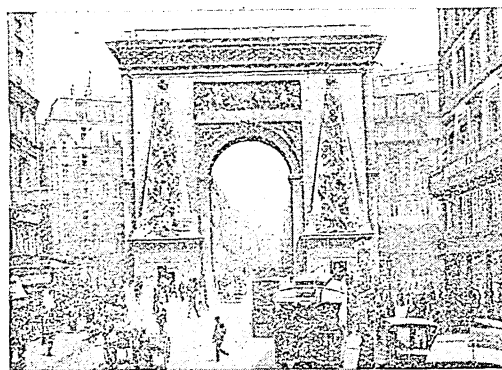
THE TOWN HALL AT LYONS



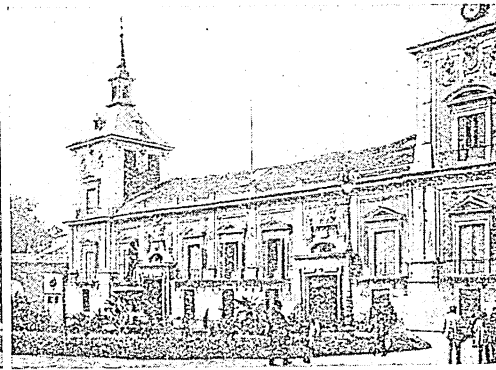
THE PALACE OF JUSTICE AT ROUEN



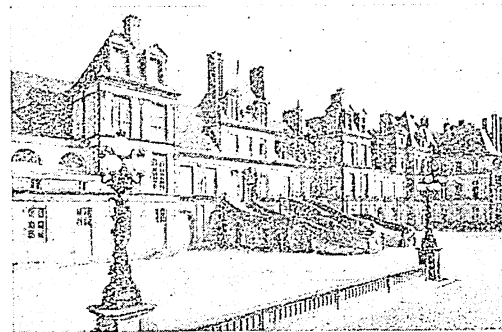
THE HOUSE OF JACQUES COEUR AT BOURGES IN FRANCE



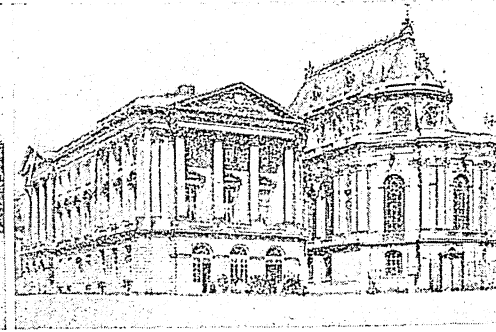
THE PORTE ST. MARTIN IN PARIS



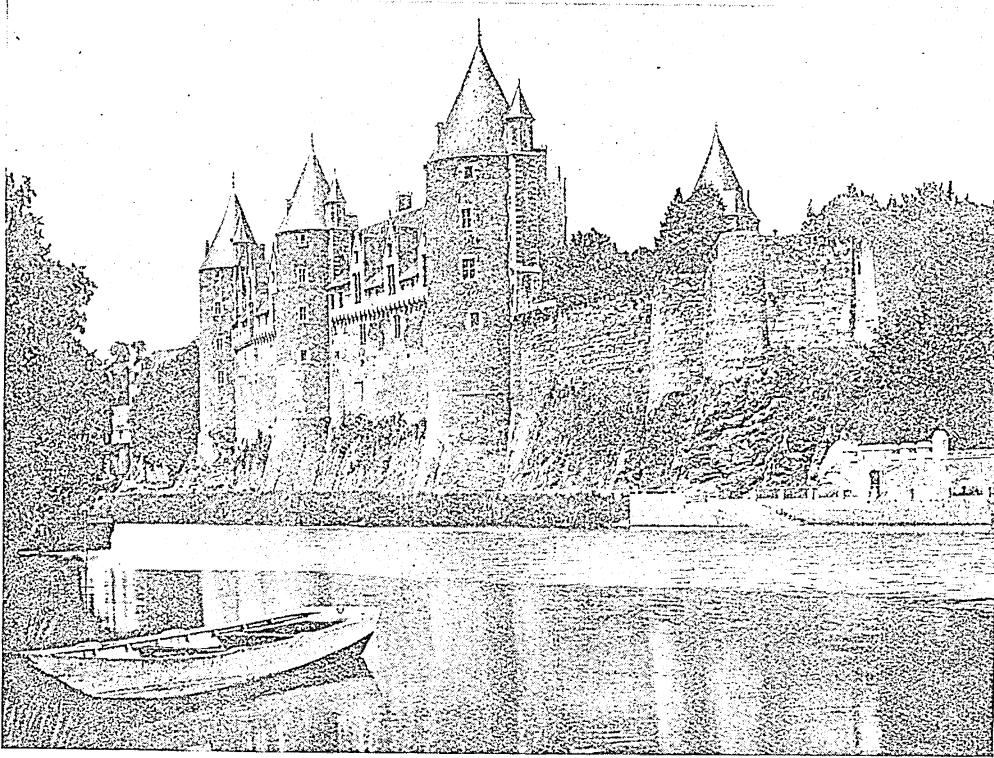
THE CASA AYUNTAMIENTO AT MADRID



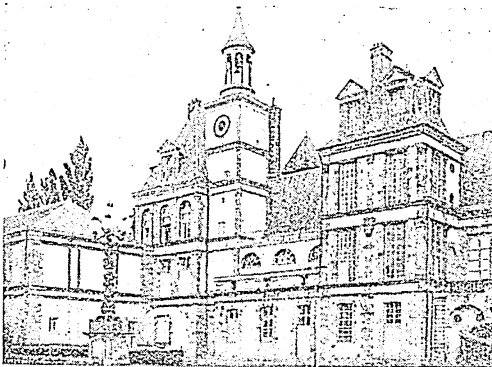
THE FAMOUS STAIRWAY AT FONTAINEBLEAU



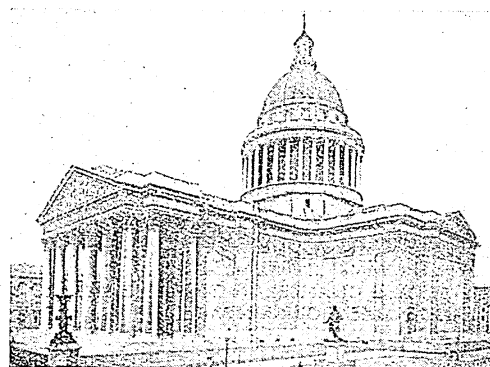
THE CHAPEL OF THE PALACE OF VERSAILLES



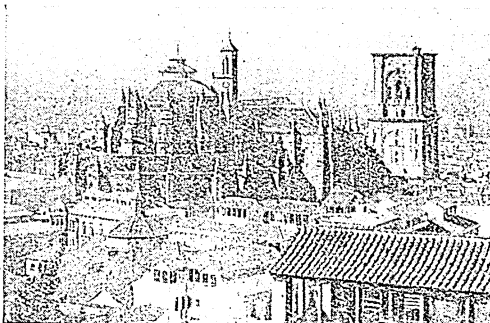
THE CHATEAU OF JOSSELYN AS IT RISES ABOVE THE RIVER OUST IN MORBIHAN FRANCE



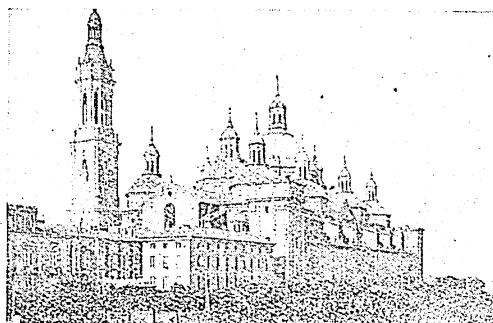
THE COUR DES ADIEUX AT FONTAINEBLEAU



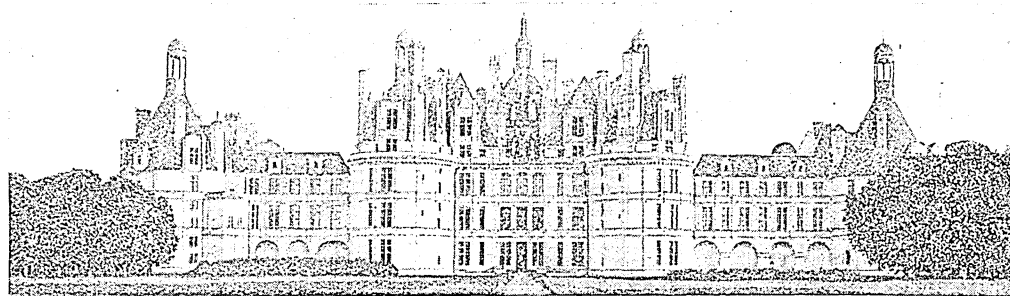
THE PANTHEON IN PARIS



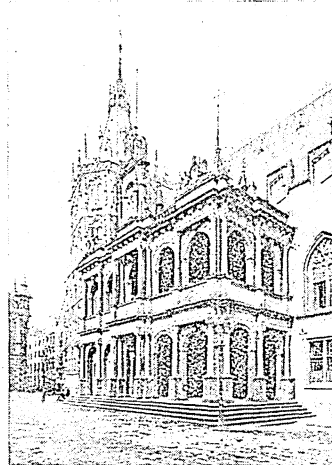
THE CATHEDRAL AT GRANADA IN SPAIN



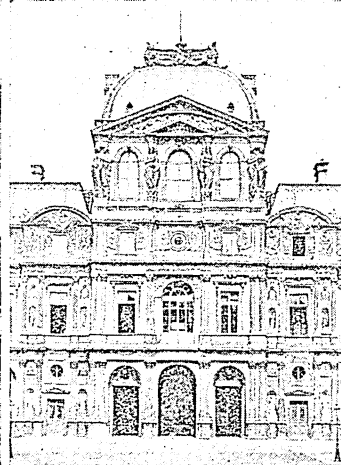
NUESTRA SENORA DEL PILAR AT SARAGOSSA



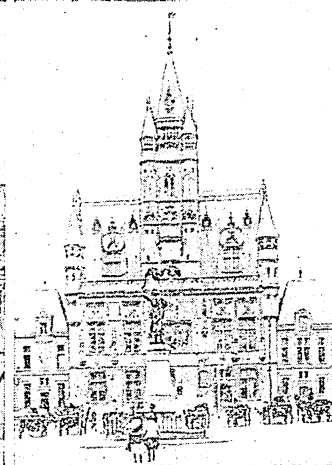
THE MAGNIFICENT CHATEAU AT CHAMBORD IN FRANCE



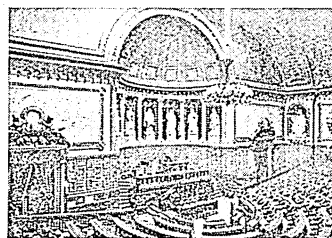
THE PORTICO OF THE RATHAUS
AT COLOGNE



THE LOUVRE, PARIS—PAVILLON
DE L'HORLOGE



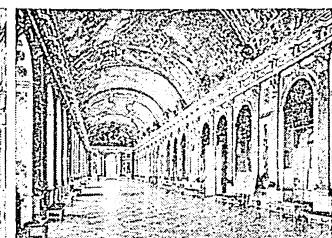
THE HOTEL DE VILLE AT
COMPIEGNE



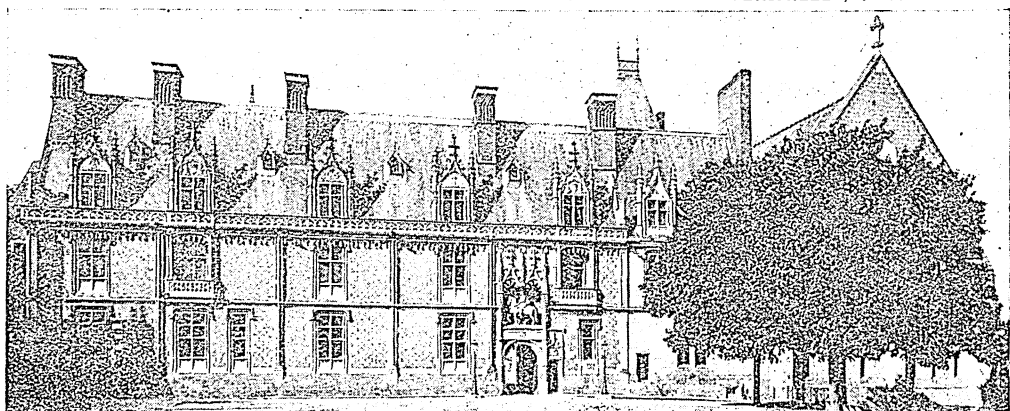
THE SENATE CHAMBER IN THE
PALAIS DU LUXEMBOURG IN PARIS



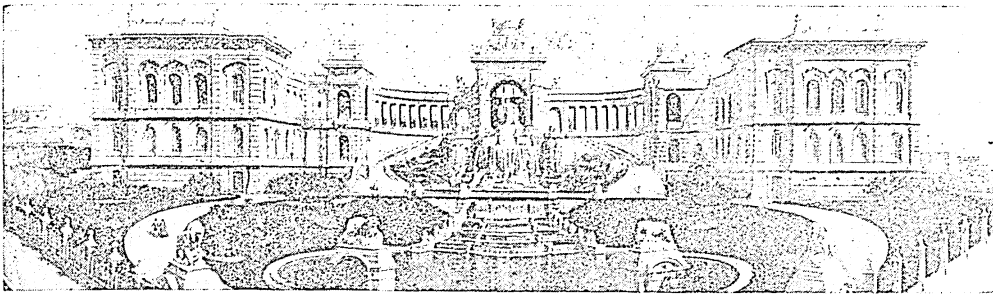
THE LIBRARY OF THE ESCURIAL
NEAR MADRID



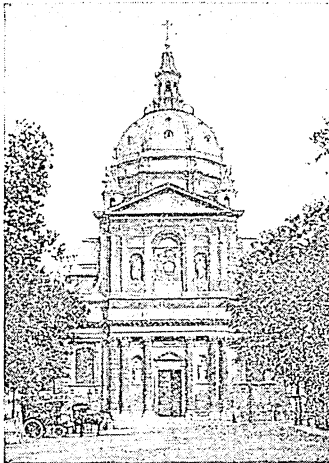
THE HALL OF MIRRORS AT
VERSAILLES, NEAR PARIS



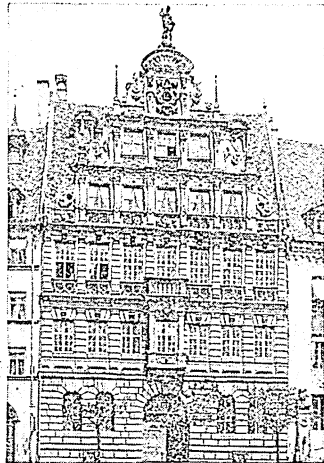
THE LOUIS THE TWELFTH WING OF THE CHATEAU OF BLOIS



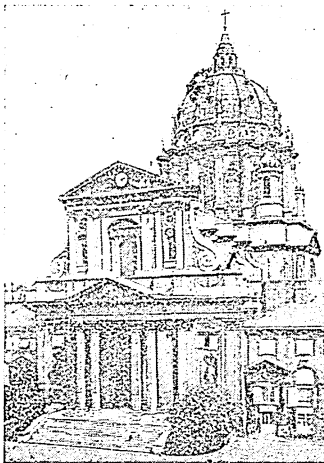
THE PALAIS DE LONGCHAMP AT MARSEILLES



THE SORBONNE IN PARIS



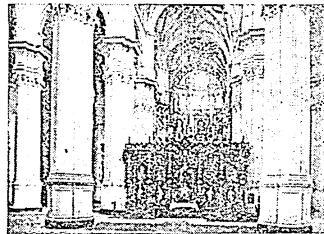
THE PELLERHAUS IN NUREMBERG



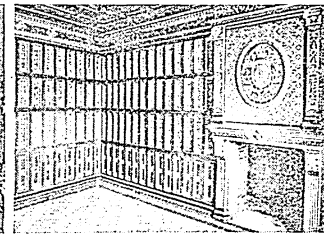
VAL-DE-GRAVE CHURCH IN PARIS



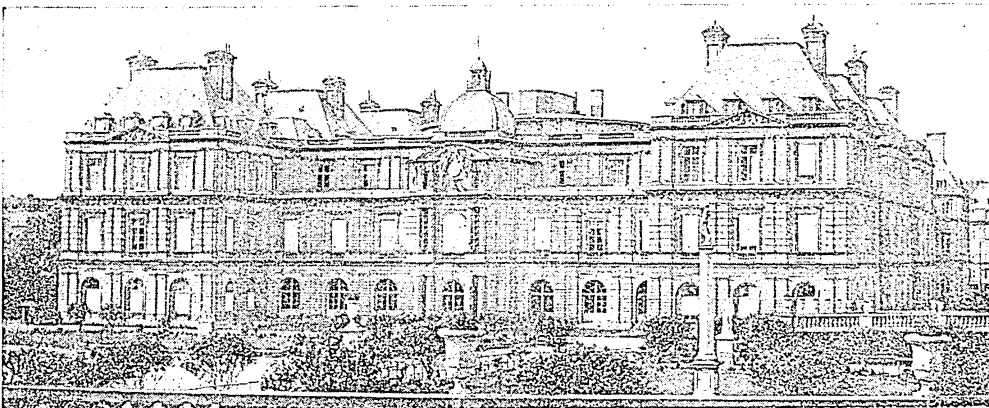
THE SALLE DE LEYS IN THE
HOTEL DE VILLE, ANTWERP



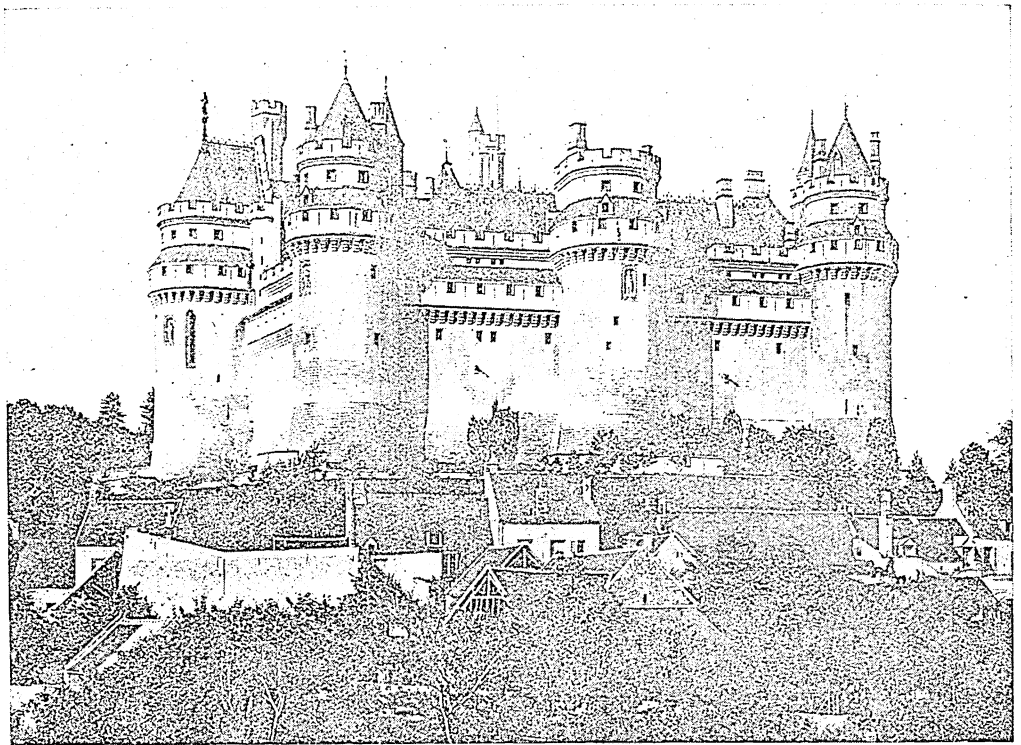
GRANADA CATHEDRAL,
SPAIN



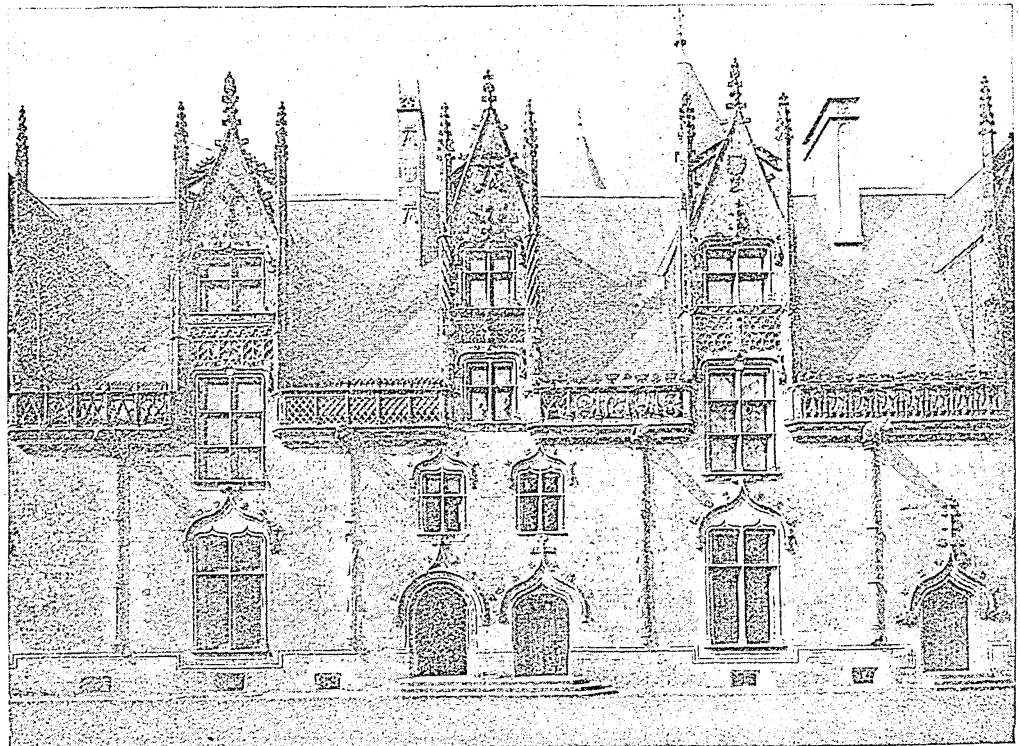
A CORNER OF A ROOM IN THE
CHATEAU OF BLOIS



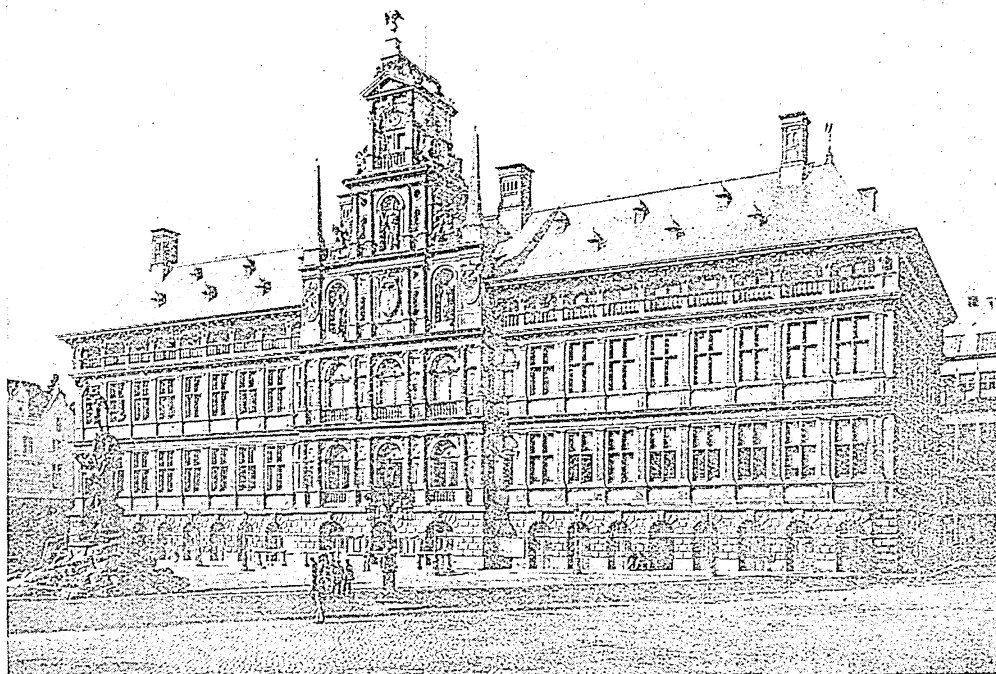
THE PALAIS DU LUXEMBOURG IN PARIS



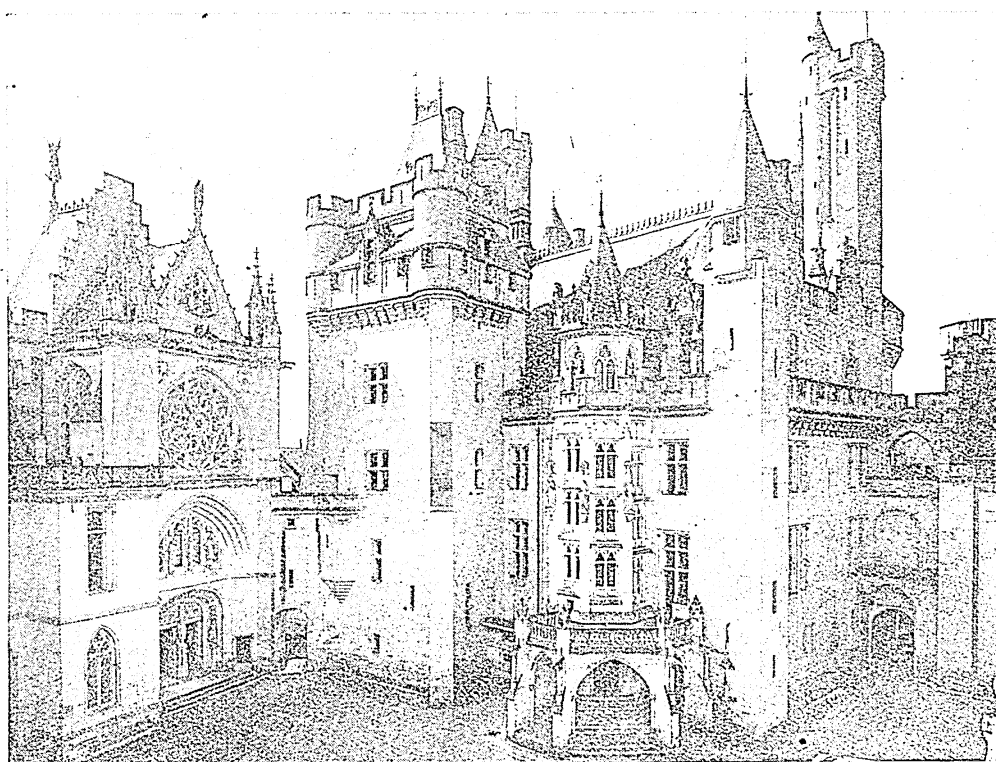
THE NORTH FRONT OF THE CHATEAU OF PIERREFONDS IN FRANCE



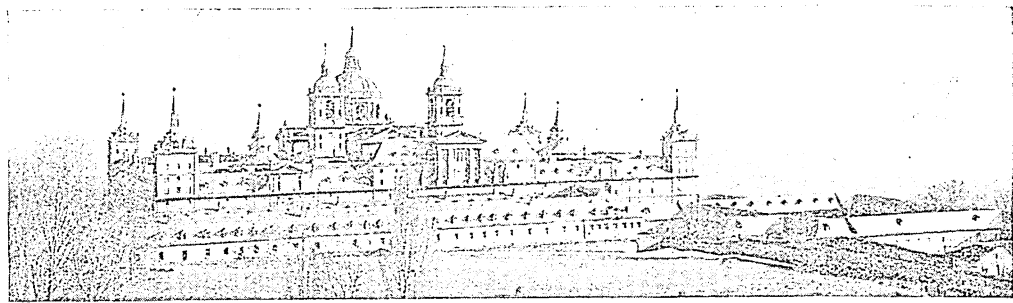
THE CHATEAU OF JOSSELIN IN FRANCE. WITH ITS QUAIN DORMER WINDOWS



THE HOTEL DE VILLE, OR TOWN HALL, AT ANTWERP



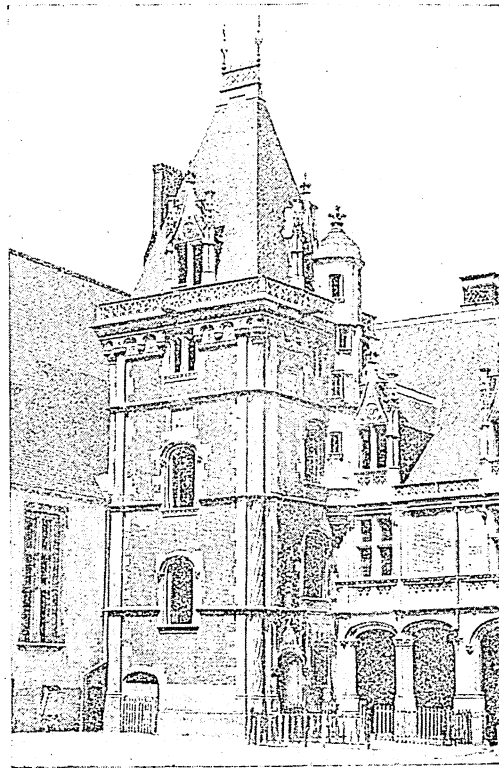
THE CHATEAU DE PIERREFONDS, SHOWING THE CHAPEL AND THE STAIRCASE OF HONOUR



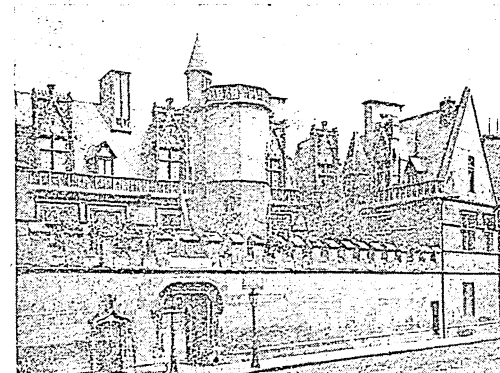
THE ESCURIAL, THE GREAT PALACE AND MONASTERY NEAR MADRID



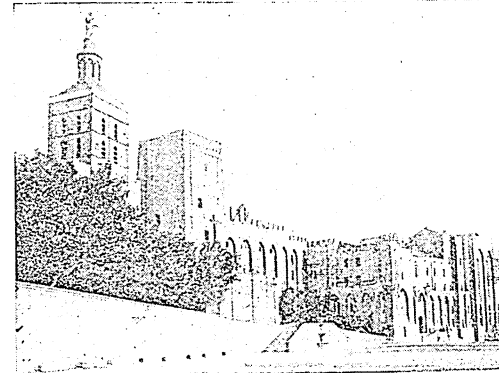
THE FAMOUS SPIRAL STAIRCASE AT BLOIS



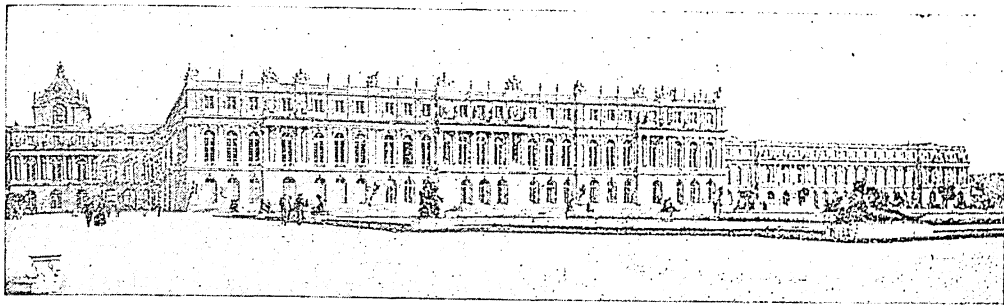
AN ENTRANCE TO THE CHATEAU OF BLOIS



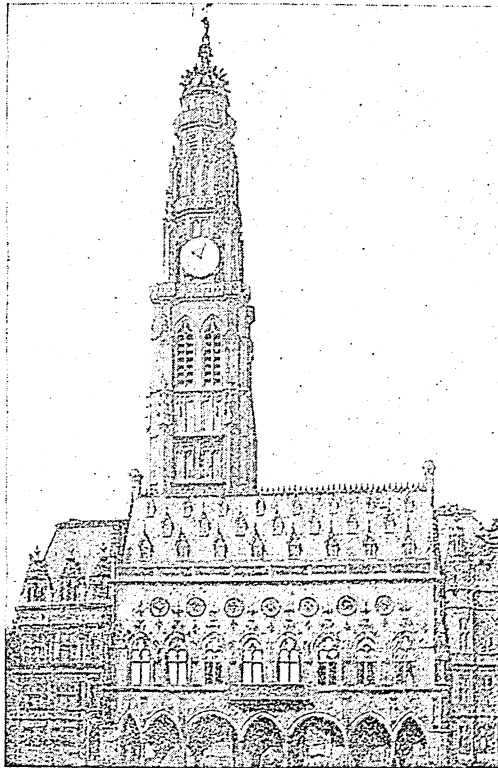
THE BEAUTIFUL CLUNY MUSEUM IN PARIS



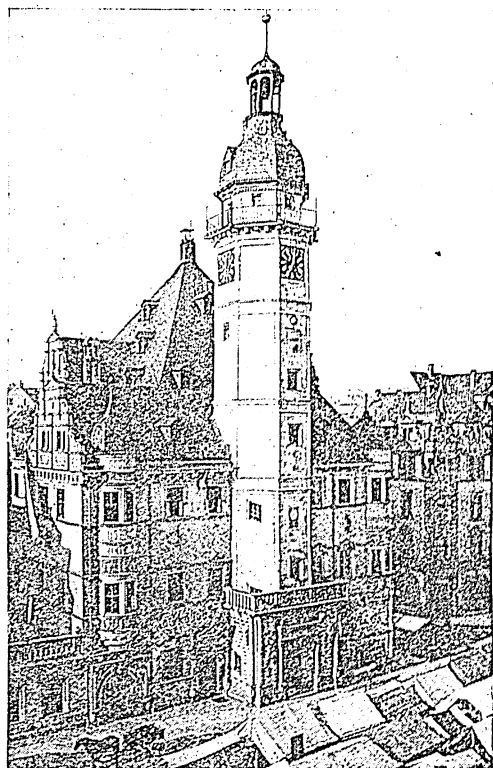
THE PALACE OF THE POPES AT AVIGNON



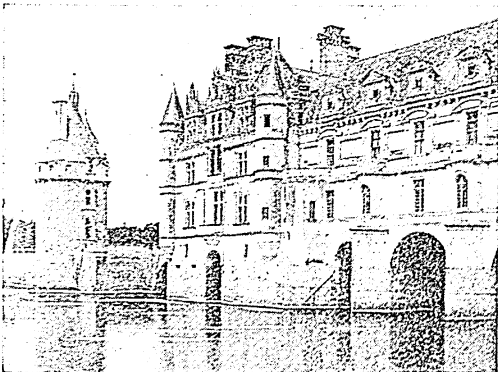
THE BEAUTIFUL CHATEAU OF VERSAILLES JUST OUTSIDE PARIS



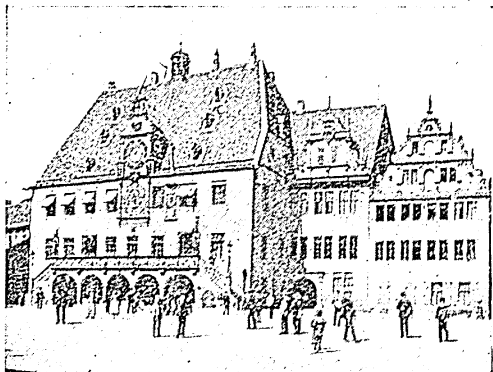
THE TOWN HALL OF ARRAS AS IT WAS
BEFORE THE WAR



THE RATHAUS, OR TOWN HALL, AT ALTENBURG
IN GERMANY



THE CHATEAU OF CHENONCEAUX IN FRANCE



THE RATHAUS AT HEILBRONN IN GERMANY

along the Louvre the connecting gallery with the Tuileries, a scheme taken up about three hundred years later.

Henry the Fourth set Du Cerceau the architect to work on the Louvre in the early years of the seventeenth century. Du Cerceau's work was largely lost in the alterations made by Napoleon the Third from 1860 to 1865. Next, Louis the Thirteenth and Cardinal Richelieu set to work, with Lemercier as architect, who began, about 1625, the large court of the Louvre. His labours are best remembered by the Pavillon de l'Horloge in the middle of the west façade.

SIR CHRISTOPHER WREN AMONG THE ITALIAN ARCHITECTS IN PARIS

The next in this interesting procession of kings who loved building is Louis the Fourteenth, with Cardinal Mazarin and Colbert the great minister. These first set Le Van to work about 1650 to finish the court Lemercier had begun, then ordered Claude Perrault to design the long eastern façade, 600 feet long. By this time the pure French early Renaissance spirit had been lost in a wholesale imitation of Italian architecture. Colbert and his master Louis the Fourteenth had called in all the Italian artists and architects they could. Bernini, who planned the great piazza of St. Peter's in Rome, was summoned to Paris to give designs for this very part that Perrault built. It was while the best men of France and Italy were thus concentrated in Paris, and the new projects for the Louvre were in everyone's mouth and an intense enthusiasm for art filling the capital, that Christopher Wren made his journey to Paris. He saw Bernini, we remember, but the "crabbed old Italian" had little to say to him, and soon went back to Italy, having very probably given Perrault his first idea for the famous eastern façade.

ART SWALLOWED UP IN FLATTERY IN THE PALACE OF VERSAILLES

Presently Louis the Fourteenth, the "Sun King," whose bad influence on art we read about in another part of our book, turned his attention to the building of Versailles, a pleasure palace where the glory and greatness of Louis could be extolled and his name carried down to the farthest posterity. Versailles is, on the whole, a very uninspired building, whose chief architects, Le Van and Mansard, imitated the Italian Renaissance without succeeding in catching its greatness, and, absorbed in this

imitation, forgot the excellent teachers they had in their own French Renaissance masters. The interior of Versailles was given up to mirroring the grandeur of the Sun King; art was swallowed up in flattery. Incredible sums of money were lavished on this palace.

The Petit Trianon, a country house for one of the court favourites, was set up at Versailles during the next reign, in a rather happier manner; this little palace becoming the favourite residence of the ill-fated Marie Antoinette.

From toward the end of the seventeenth century till after the Revolution little more was done to the unfinished Louvre. Napoleon the First set Percier and Fontaine to work there. They planned and began the connection with the Tuileries which Catherine Medici had wanted. Napoleon the Third carried on this idea, the work being in the hands of Lefuel and Visconti about 1850. These two built the "New Louvre"—the part close to the Tuileries. Lefuel was labouring at other parts of the great pile from 1860 to 1878. In the meantime the palace of the Tuileries, which had shared the genius of France's best architects, including Philibert de l'Orme and Bullant, had been destroyed. The outer arm of the Louvre, which was to touch it, was therefore rendered a little meaningless. All that is left of the Tuileries is a piece of the façade, in the Tuileries garden.

THE GREAT DOMES WHICH REPLACED GOTHIC SPIRES AND TOWERS

The Renaissance in France changed the face of the country as effectively as Wren's churches changed the face of the City of London. Where the Gothic spires and towers had dominated the skyline presently rose up the huge domes that were the chief feature of the new sacred buildings. At first, past and present were curiously mixed, as in the churches of St. Eustache and St. Etienne du Mont in Paris. They were built about 1532. It is very interesting to see these structures built on medieval lines, with flying buttresses and rounded apses, bearing the unmistakable stamp of the Renaissance in decoration and wall treatment.

Lemercier, the architect of St. Eustache, also designed the church of the Sorbonne, which was built about a hundred years later. It has the usual classic front and the dome of the Renaissance church. St. Sulpice, Val de Grace, St. Paul, and

THE RENAISSANCE IN EUROPE

St. Louis were built about the same time as the Sorbonne. Here, in the latter church, the Baroque style is creeping in, with its curves and florid ornamentation. The church of the Val de Grace was built by Mansard, St. Sulpice by Le Van, the two chief architects of Versailles. St. Sulpice is an immense church, with eighteen chapels. Its wonderful pillared façade was added by Servandoni.

THE SPREAD OF THE RENAISSANCE INTO THE SMALLER COUNTRIES

Mansard also built the dome of the church of the Invalides—one of the finest domes in Europe. In 1755 the Panthéon rose, as if to crown the labours of the Renaissance movement in France, but the dome is not so fine as that of the Invalides, built a hundred years earlier.

The Renaissance found its way into the smaller countries of Europe, and while the marvels of the Louvre, and the Invalides, and châteaux like Chambord, were rousing the enthusiasm of the French and being influenced by French art, a number of buildings were rising in the Low Countries of the Rhine lands and being equally influenced by the art already existing there. It seems natural that French Renaissance buildings should have their own distinction, due to the exquisite taste and refinement of the French peoples, and that the Belgian, Dutch, and German Renaissance buildings should have their difference rather than distinction, due to the florid and less refined tastes of the peoples concerned. Dignified and restrained architecture of the Renaissance at its best, as in the Louvre, or parts of Greenwich Hospital, could have no hold in countries whose natural tastes led them to like more ornament, more twists and curves, much decoration.

PERSISTENT GOTHIC FEATURES IN THE RENAISSANCE BUILDINGS OF GERMANY

East of the French border, the masterpiece of the Renaissance is Heidelberg Castle as shown in the parts built between 1531 and 1612. In spite of its period the castle contrives to be more Gothic and medieval in spirit than anything else. It is an interesting array of halls and wings grouped about an open space, with the great watchtower dominating the whole mass. It seems that the builders of the varying periods only set up an even sky-line under protest. They loved the broken-up Gothic shapes much more than a horizontal, classical contour

How much the steep Gothic roofs were beloved in Germany we can see from their old houses in Nuremberg, and at Hildesheim in Hanover. The builders clung to this style when the Renaissance was telling them to feel differently: hence buildings like the Rathaus in Altenburg, the Rathaus in Heilbronn, the Pellerhaus in Nuremberg, the Gewandhaus in Brunswick. The sixteenth-century Stuttgart Castle and the Zwinger Palace in Dresden, built in 1711, show a good deal of the picturesqueness of German Renaissance.

A number of public buildings, mainly Town Halls, were set up in this period in the Netherlands, and to many existing Gothic piles Renaissance additions were made, as in the town halls of Ghent, Delft, and Haarlem. The charming little Town Hall of Ypres was shattered under the German guns in the Great War, like so many other Belgian monuments of the Renaissance. Antwerp Town Hall is a sturdy, well-built pile with a façade over three hundred feet long and a richly-decorated centre pavilion. The sixteenth-century town hall of Leyden is supposed to be the best in Holland.

THE NEW STYLE OF CHURCHES WHICH AROSE IN EUROPE

The guild houses of Brussels and Antwerp form another group of Renaissance buildings most interesting in character as in history. Other little monuments of this period which we should not forget are the Maison de l'Ancien Greffe, now part of the Law Courts of Bruges, and the Musée Plantin, Antwerp, which was built in 1550 for a merchant, and later used as a printing works.

The Roman Catholic reaction against the Reformation was responsible for a sudden zeal in church building, led mainly by the Jesuits, and the general spirit of the new erections was Baroque or Rococo, which, we remember, was the last exuberance of the Renaissance style. Europe was dotted with these new churches.

Several of them rose in the Catholic parts of Belgium in the seventeenth century. Protestant Holland and Germany would have little to do with them. St. Michel in Louvain is an example of this late Renaissance style. There are many such churches in Antwerp, Bruges, Namur, and Brussels.

The churches that were erected in Germany during the sixteenth, seventeenth, and eighteenth centuries are curious

blends of all styles, Gothic and Renaissance and Classical being sometimes mixed up in one church. Buildings like the Marienkirche in Wolfenbüttel, the church in Bückeburg: St. Michael in Munich, Salzburg Cathedral, and the Neumünster in Würzburg are interesting revelations of a peculiar taste, but they cannot be called great architecture; they are over decorated, lacking dignity and restraint.

**THE REMARKABLE BUILDING DESIGNED
BY MICHAEL ANGELO'S PUPIL**

Baroque architecture was a little more at home in Spain than in north-western Europe, the country being already saturated with the rich extravagances of Moorish art. Both early and late Renaissance in that country produced interesting buildings of a free and fanciful type. Between these two periods was a spell when, for about a hundred years, architects who loved ancient Rome tried to graft a classical style on Spanish architecture. The most important architect of this middle period was Juan de Herrera, a pupil of Michael Angelo.

Herrera was the chief designer of one of the most famous piles in the world—the Escorial, some thirty miles from Madrid. This group set up from 1559 to 1584 includes monastery, college, church, and palace. Philip the Second, for whom the Escorial was built, loved the great austere mass of yellowish-grey granite, and inside its severe walls perhaps found peace.

Herrera allowed himself most wisely to be dictated to by the material he was using, and the site. These masses of granite rising up on the sun-bleached, lovely land, must not be trimmed or decorated, must heave themselves up as if nature had flung them there. Hence the remote, grand look of the Escorial, seen for the first time, from a distance, with its long, unbroken walls and corner turrets, the high central dome and towers of the church. Herrera designed many other buildings, including the Casa Lonja in Seville, and the unfinished Valladolid Cathedral. But nothing else in Spain shared the magnificent austerity, the sobriety, of the Escorial.

**BEAUTIFUL STONEMASONRY THAT VIED
WITH THE SILVERSMITH'S ART**

Before and after the period that saw the Escorial built a great many rich and fantastic palaces and churches rose in the peninsula. The earlier period is the more charming where Moorish, Gothic, and

Renaissance styles mingle in any one of many buildings.

The kind of decoration achieved was so rich and fanciful and beautifully finished, and seemed so like a metal-beater's or silversmith's work, but in stone, that it was given the name Plateresque—from platero, silversmith. This peculiar beauty can be seen in the Casa de Ayuntamiento in Seville; the Casa de la Conchas in Salamanca; the Casa de Miranda in Burgos.

During this time, the early sixteenth century, most interesting additions were made to the Alcazar, Toledo, in the form of new façades to the old, Moorish-Gothic granite castle. The best example of early Renaissance secular architecture in Spain is the palace of Charles the Fifth at Granada, built to adjoin the Moorish Alhambra. Here a square mass of building in golden coloured stone, inset with tinted marble, is set about an open circular court. Round the court runs a fine colonnade of Doric and Ionic columns.

Granada Cathedral is the finest religious expression of the Renaissance in southern Spain. It was begun by Diego de Siloe, in 1529, in memory of the triumphs of Ferdinand and Isabella, and though unfinished is a most magnificent pile. St. Estéban, Salamanca, built about the same time, more in the Plateresque style, is a charming combination of Gothic, Moorish and Renaissance art. Jaen Cathedral and Malaga Cathedral belong to the same period, and are very beautiful.

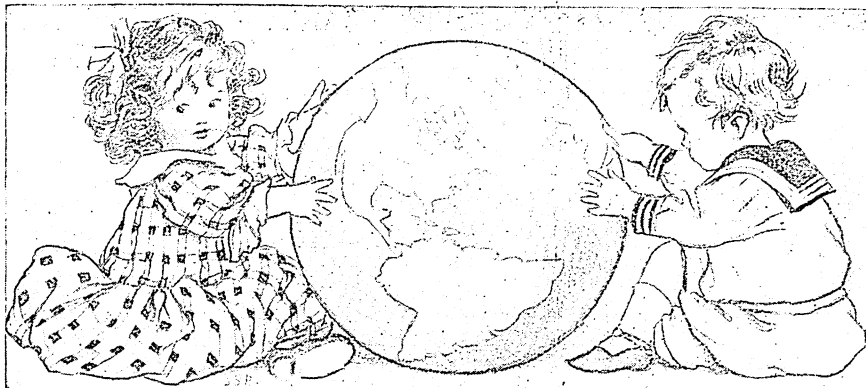
**SPAIN AS THE HOME OF LOST
CAUSES IN ART**

Later on, in 1677, came Nuestra Señora del Pilar, Saragossa; and a hundred years later still, St. Francisco in Madrid, a domed church which was intended to be a great tomb house of the famous men of Spain.

In her architecture of the varying periods Spain could not help enriching all that she borrowed from other countries. Her builders were peculiarly gifted in their ability to pile on ornament without making their architecture florid; to make innovations which are so successful that one wonders why they were not made elsewhere.

The truth probably is that, where all art is concerned, Spain is a land of genius. And at the same time, where architecture is in question, Spain may be called the home of lost causes. So much was triumphantly begun and never finished; so much has fallen into ruin and lies in ruins where it fell.

The Wonderful House We Live In, and Our Place in the World



OURSELVES AND THE NATION

HOWEVER far back we go in the history of thought we find it recognised that man is, as Aristotle called him, a social animal. "None of us liveth to himself, and no man dieth to himself." We are members one of another. No one knows what a solitary human being would be like, for the best of all good reasons, which is, that there could not be a solitary human being. Each of us is part of a great whole.

People used to talk of "man before society," but no one can now believe that there ever was a time when man existed and a state of union between men did not exist; and we are all agreed that Aristotle is right, and that we are social by our very nature. The ancestors of mankind must have been social, and man has been a social being from the first.

One remarkable result of this, which has, curiously enough, been constantly forgotten, is that no one knows what a single human being unaffected by other human beings would be like. Not only do we not know, but we never can directly know. We are so made that it is quite impossible for a human being to exist at all apart from the influence of other human beings over him. We come into the world helpless, less able to take care of ourselves than any other creature, animal or vegetable, and we remain helpless for a longer period than any other creature.

From our first hour we are dependent on others, who influence us from the cradle to the grave, so that every one of us is, in some degree, a social product. We have been partly made by those who have surrounded us, and as no human being can grow up without these influences, it is scarcely worth while even to guess what a human being would be like without them.

But we do know that children a few years old have been lost and have managed to live in a wood or forest. As they have grown up we find that such beings have become less than human. They have missed the human companionship which every one of us needs, though, of course, they had it in their earliest years, or they could never have existed. Such persons can only be classed as idiots. Now, the word *idiot* comes from the Greek, and means a person who is by himself and has nothing to do with anyone else, or, as John Ruskin puts it, a person entirely occupied with his own concerns.

If we take a grown-up, healthy, sane, intelligent human being, and separate him entirely from the company of all other men, he will lose his reason and become less than human. The solitary man becomes insane. All this might be proved and discussed at any length, for it is one of the most important facts in the world. We are in very truth members one of another.

BODY, MIND, AND SOUL · CITIZENSHIP · ECONOMICS · GOVERNMENT



OURSELVES

We must again go back to Aristotle, and even to Plato, his master, for the next great truth which we must learn, a truth which follows directly from what we have been saying. It is that a nation is not just a number of people, like a heap of bricks or grains of sand, but is a whole—just as a heap of bricks becomes a whole when the bricks are built up to make a house.

THE GREAT TRUTH THAT A NATION IS LIKE A LIVING BODY

We can see that this must be so if every individual is, in part, a product of all other individuals, and helps to produce the others by direct and indirect influences on them. So we have many phrases to express the idea that, in a sense, a nation is like a great living creature. We call it the body politic, or the social organism, and sometimes figure it as a noble woman, Britannia, for example. This comparison of a nation with the body of a living individual is a very valuable one.

Elsewhere in this book we read that, though an atom is a whole, it is made up of parts called electrons, and we are only now beginning to understand the atom because the key to every fact about it lies in the nature of the electrons that make it. On a higher plane we learn that the living body, though it is a whole, is made up of parts called cells, which are themselves alive; and we have only begun to understand the living body since we learned something about the nature of the cells which make it up.

HOW OUR OWN BODY HELPS US TO STUDY THE LIFE OF A NATION

So, also, we may imagine that the nation is a living body, but we shall never really understand the life of a nation till we understand the nature of the persons who make it up. That is the great key which governs all true thinking about a nation; and that is why we have been very carefully studying the lives, the bodies, and the minds of ourselves, so as to lead up to the study of the nation of which each one of us, young or old, is a part.

Now let us go a little more carefully into this comparison between the individual and a nation made up of many individuals or units.

When we learn the history of life we find that living creatures were at first

made of only one cell each; then of a few cells, which stayed together and were all alike; then of cells, few or many, running at last into billions of billions, which became different from one another. It is in this difference that the possibility of progress lay, some cells doing one thing and others doing another. The same is true in a nation; in a nation the term usually employed is division of labour.

This division of labour does not mean merely that when there is a lot of water to be carried from one place to another the labour is divided between ten men, each of whom takes a bucket and runs backwards and forwards. It means, so to speak, that one man grows indiarubber and another manufactures indiarubber pipes; that another gets iron out of the earth, while another makes iron into taps; so that by this kind of division of labour the work is done far more easily than if all men did the same thing. Now, when a great Frenchman was studying the life of the body he saw that this division of labour occurs in the individual body, as it does in the body politic; and so he called it the *physiological division of labour*, by which name it has been known ever since.

THE LIFE OF THE BODY AND THE LIFE OF THE NATION

Now with this key we can begin to understand many things. A nation has to live just as the body has to live; it has to have men to guide it, and the men who guide a nation correspond to the nerve-cells of the brain. It has to have men who make special things for the nation, and the manufacturers correspond to the gland-cells of the body. It has to have people like soldiers, scavengers, doctors, and nurses to protect it from enemies inside and outside; and the bodies of these protectors correspond to the white cells of the blood, which kill microbes, remove dirt from the air-passages, and carry medicine and food to the parts of the body that have been injured.

The body could not exist without the division of labour; and the division of labour could not be carried on as it is unless the cells of the body were different. A nerve-cell cannot do the work of a red blood-cell, nor a red blood-cell that of a nerve-cell; and neither of them can do the work of a muscle-cell; and any of the three would make a very poor cell to

OURSELVES AND THE NATION

cover the outside of our teeth. So we might go on endlessly.

Now, the point is that this is precisely true of a nation. If all the cells of the body were born the same it could never be a body at all; and if all men were born the same they could never make a nation.

THE DIFFERENCES IN PEOPLE THAT MAKE FOR THE GOOD OF THE NATION

Fortunately, all men are born more or less different; our faces are all different, and it is now beginning to be seen that this difference in our faces corresponds to deeper differences which are in all of us. No doubt it is true, or ought to be, that we are all born equal in the sense that we all ought to have an equal chance, but nothing is more ridiculously untrue than to suppose that all men are by nature born equal, unless it be to suppose that they are by nature born the same.

We are all born different, and, as for equality, we are born on very different levels by nature. But this is necessary and right. One man has great strength and endurance, but nothing else; we cannot say that he is equal to a man who is a great thinker. But that great thinker may be very weak and puny. Each can help the other. Ages ago the Emperor Marcus Aurelius declared that, instead of disliking or despising people who are different from ourselves, we ought to say "the universe has need of them." A more modern way of saying this is that "it takes all sorts to make a world." It certainly takes all sorts of cells to make a human body, and in the same way it may be said that it takes all sorts of human beings to make a nation.

One of the first needs for any nation is to realise these truths. We must learn that we are all dependent on one another, as regards our particular nature and also as regards the particular kind of work we have to do.

THE FIRST AND GREATEST DIVISION OF LABOUR THAT MUST ENDURE FOR EVER

Ages ago, in rude and savage tribes, though there always was division of labour, there was not nearly so much as there is now. The first and greatest and most eternal division of labour, which is that between men and women, is older than mankind and must endure for ever.

There was also a certain amount of division of labour between young and old, between the skilful and the strong, between

the enterprising and the stay-at-home. But, just as the difference between a low form of animal and a high form of animal is to be found in the greater division of labour in the higher animal, in the same way we find that high nations cannot exist without increasing division of labour.

More and more people become specialists, just as the five or six different kinds of white blood-cells are specialists, and all white blood-cells taken together are specialists as compared with other blood-cells, and all blood-cells together as compared with the rest of the body. This division of labour, or making of specialists, is a very great fact.

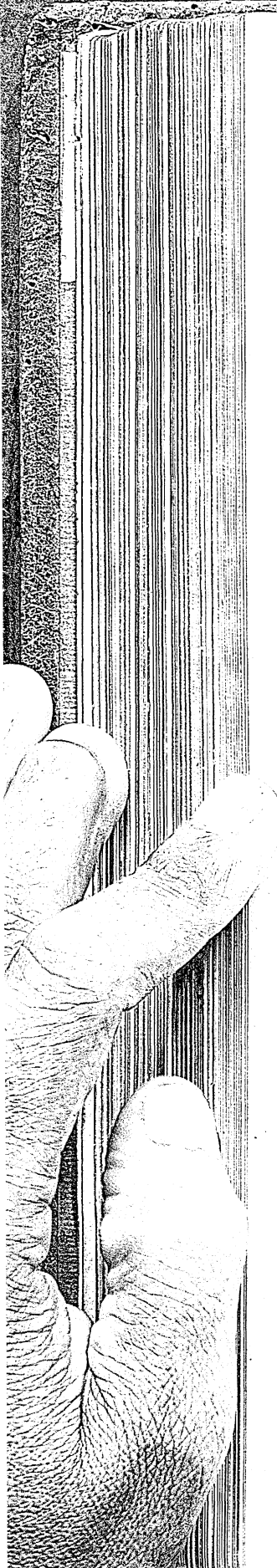
There is a famous old story of a revolt in the body, when the other parts of it said that the stomach did no part of the work and got all the food. Of course, we see that that would be a very foolish thing for the body.

WHAT WOULD HAPPEN IF THE PARTS OF OUR BODIES QUARRELLED

It would be just as bad for the body if the stomach revolted and said it would keep all the food it received. The stomach would get indigestion and the rest of the body would starve. That is exactly what happens when rich men seize all the wealth and will not use it for the rest of the community; and so we learn that one part of the body and one kind of cell ought not to be at enmity with another part of the body and another kind of cell. A house divided against itself cannot stand. Doctors know that perfect health is perfect harmony. It means that every part of the body, like every part of a wonderful machine, is serving all the rest and is being served by all the rest, because it is doing its own work rightly in beautiful harmony with all the others.

The great truth we learn from this is that he is an enemy of the nation who stands for any part of it against the others, unless, of course, the others are in the first place injuring it. It must be an injury to the social body to set religion against religion, or class against class, or school against school.

In some distant day, the dawn of which can only be seen by the prophet's eye, the eye of faith and hope, men will learn that what is true of one nation is true also of the whole of the nations which we call mankind. They will learn that, as



OURSELVES

to oppose one part of the body against another is to injure it or to destroy it, as strikes or labour wars injure the social body, so wars between nations injure that mightiest body of all, the living body which we call humanity.

THE LIFE OF THE NATION THAT GOES ON WHEN MEN PASS

We have now learned the great truth that civilisation and human progress depend on human variety. This has the tremendous meaning, which no nation has yet realised, that, instead of taking all our children and giving them all the same education, we must find out what each child is best fitted for, and must educate him for that.

As we go on thinking about a nation we see that there is one fact which is more important than all others. It is that though death comes to all the individuals which make up a living nation, the life of the nation persists. This brings us to the great truth which stares us in the face, that the destiny of a nation depends on its parenthood and childhood. It depends partly on the number of children that are born, partly on their quality, and partly on the care that is taken of them.

Those who have read this story of their own life from the beginning will have learned that there is no wealth but life, and that for every country the all-important fact is, not so much the kind or number of ships that are being built for it, but the kind and number of boys and girls who are being reared to health and strength so as to become useful citizens when they grow up.

THE FORCE OF A PEOPLE THAT NOTHING CAN RESIST

Everything depends on the people. All history teaches this lesson, telling us that the force that lies in a people sufficiently strong and numerous is an irresistible force which nothing has ever yet withstood.

The pressure of a great people seeking room for its expansion makes the pressure of steam, that drives a floating city across the Atlantic, insignificant in comparison. Nothing has ever resisted this expansive pressure—no laws, no tariffs, no mountain ranges; not even the untracked and stormy ocean, with nothing more than the possibility of land beyond it, has yet sufficed to restrain this incomparable force in the history of the world.

There is nothing in the world today, there is nothing in all its history, more striking than the pressure of the world's population on the space at their disposal.

And this pressure is for ever going on, for children are always coming and population is always growing. A nation's children are its greatest wealth. On them, and their character as good citizens, depends the future of the country more even than on its industries, though they also have a great effect on national character, and healthy modes of life.

Perhaps the children who read this book, and this story of their lives which has been dedicated to childhood and the future, will believe in education when they grow up. Perhaps they will become members of an education party, teaching real patriotism to our people; perhaps they will say when economy is to be practised: "Practise your economy everywhere else first, but last of all, or better not at all, on the children and on the education which they require to make them citizens of any nation that can live in the coming world." We must worship God and not mammon—life, and not gold. Gold is for life, and not life for gold. In any bargain the all-important question is not how much gold is passing, but how much life is passing, and in which direction it is moving.

THE PRECIOUS GIFT OF LIFE THAT IS GREATER THAN GOLD

We have been studying the story of our lives; let us remember a story told by Ruskin of a man who had forgotten what we must learn. In the wreck of a Californian ship one of the passengers fastened a belt about him with two hundred pounds of gold in it, with which he was found afterwards at the bottom. Now, as he was sinking, had he the gold, or had the gold him?

It is worth while asking ourselves a question like that. Life is more than gold; life is infinitely more than anything else it has ever seen or known in all its wondrous march from lowly depths to the marvellous heights it has now reached. For us the opportunity comes to be worthy of it, worthy of its powers, worthy of its happiness, worthy of the glory that awaits us when Life shall lead us onward to our destiny. Children of men are we, but not that only; it is our glory and our pride, our unspeakable joy as we go on our way through the world, that we are not children of men only, but children of God.

100 FLOWERS OF THE GARDEN



A FINE PLUME OF SPIRAEA

6377



SCABIOUS



BARTONIA



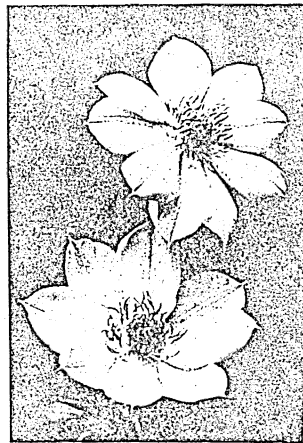
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FLEABANE



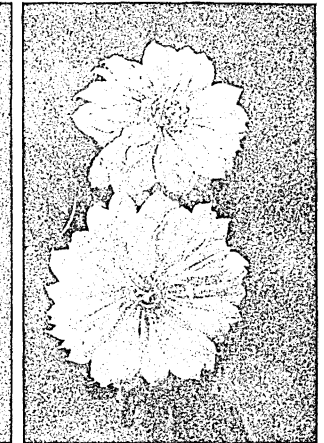
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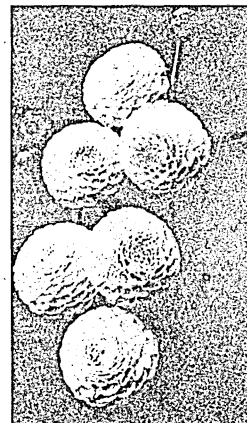
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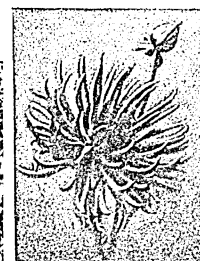
VERBENA



SNAKE'S HEAD



HOLLYHOCK



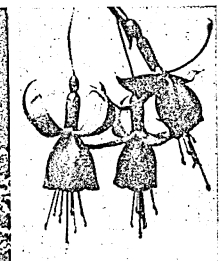
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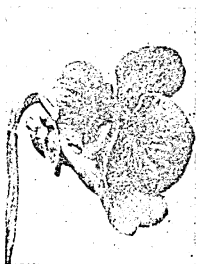
GOLDEN ROD



SINGLE FUCHSIA



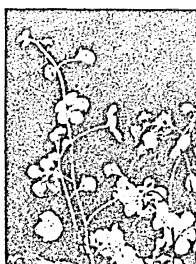
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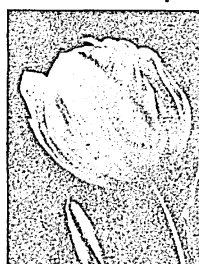
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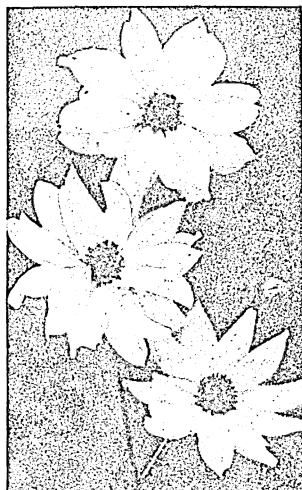
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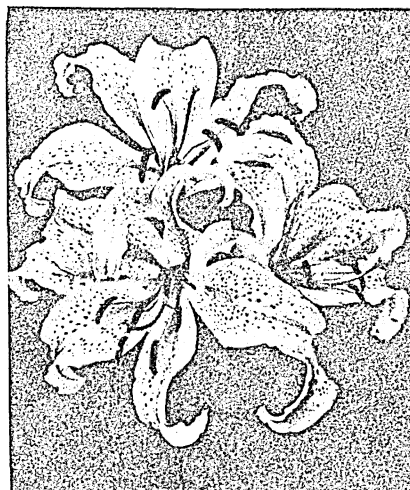
OMPHALODES



TULIP



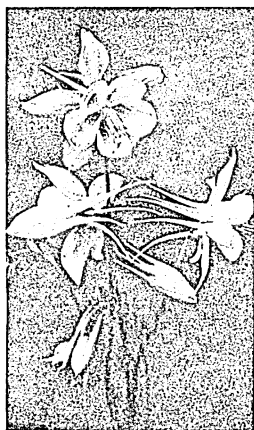
SINGLE DAHLIA



AURATUM LILY



LOS ANGELES ROSE



COLUMBINE



VIOLAS



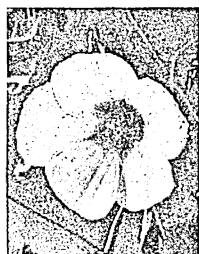
CAMPANULA



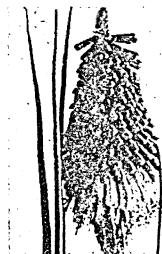
PYRETHRUM



CANTERBURY BELLS



MALOPE



RED-HOT POKER



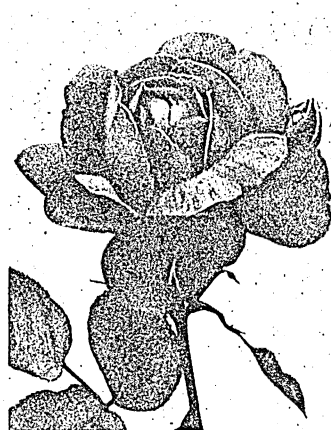
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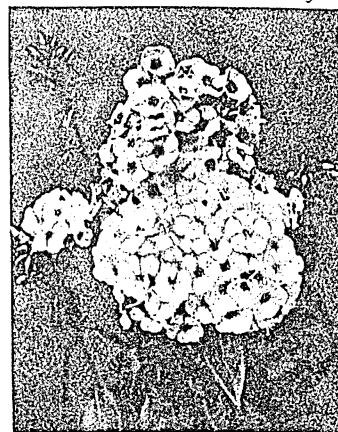
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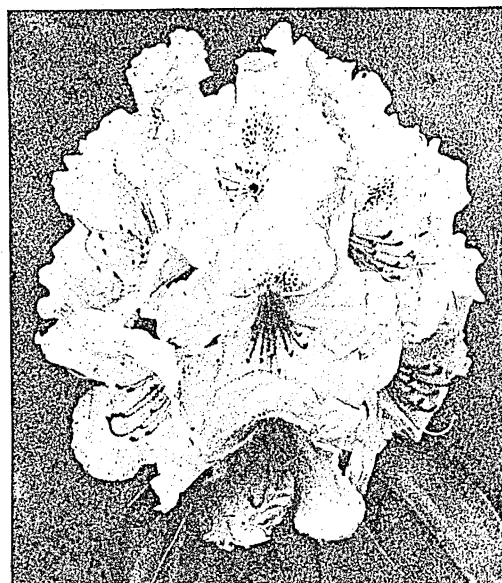
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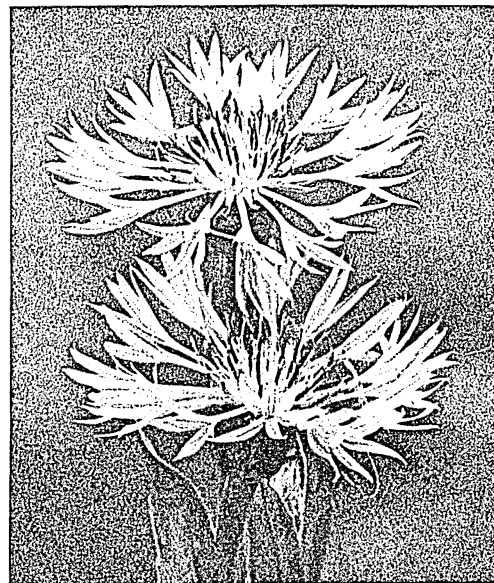
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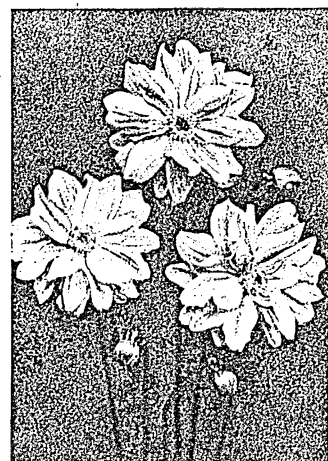
PERENNIAL PHLOX



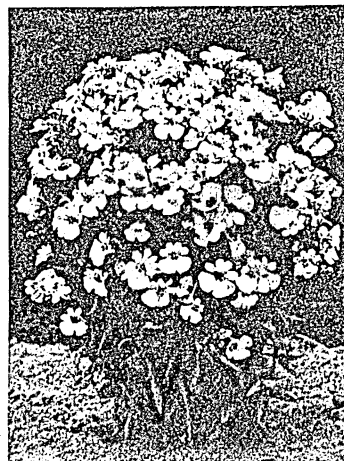
PINK-PEARL RHODODENDRON



PERENNIAL CORNFLOWER



EDITH JONES DAHLIA



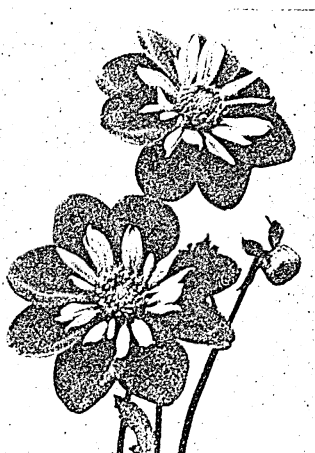
NEMESIA



AN AFRICAN MARIGOLD



BLUSHING BRIDE ROSE



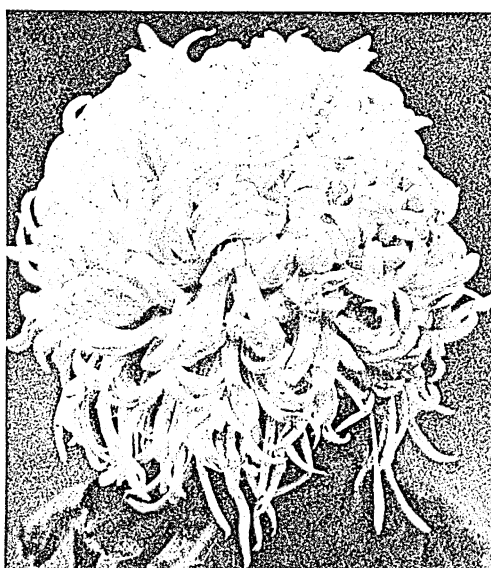
COLLARETTE DAHLIA



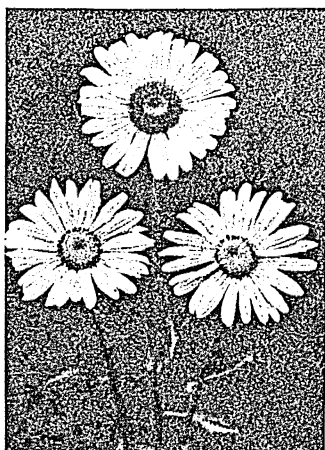
LADY MOND ROSE



GREAT GOLDEN KNAPWEED



CHILDERLEY PRIDE CHRYSANTHEMUM



SINGLE ASTERS



TURK'S CAP LILY



ANNUAL CHRYSANTHEMUM



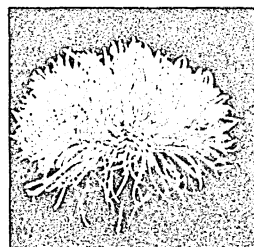
VIBURNUM PLICATUM



A FINE SPECIMEN
OF LYON ROSE



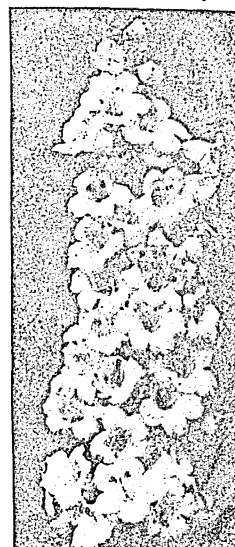
A BORDER CARNATION



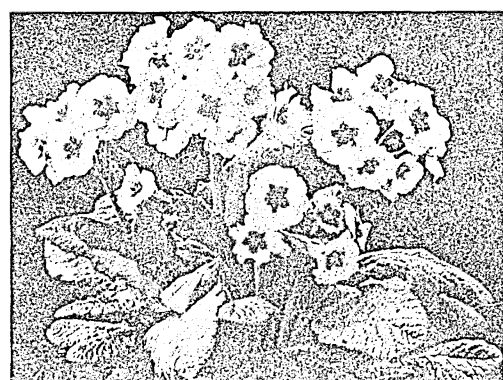
WHITETHREAD
CHRYSANTHEMUM



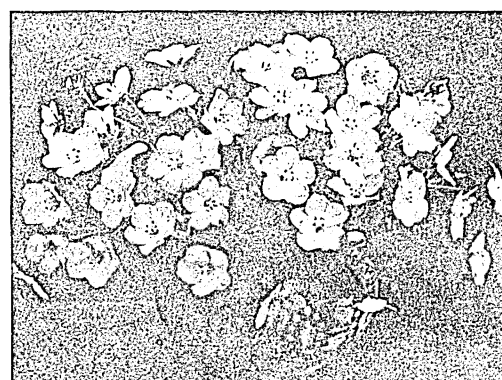
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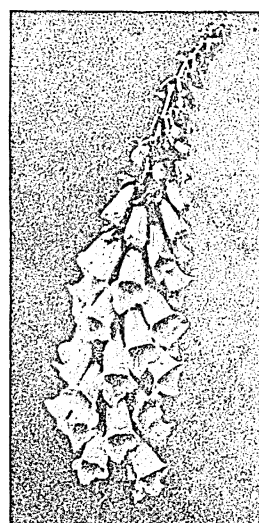
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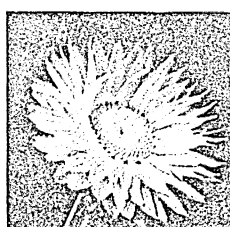
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NEMOPHILA



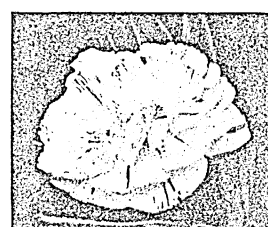
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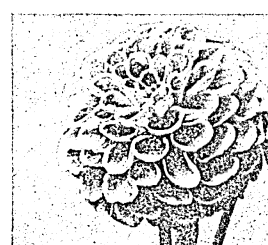
A TYPICAL
ACROCLINIUM



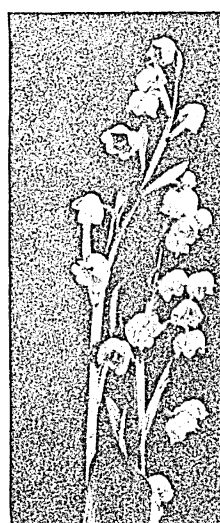
FRILLED BEGONIA



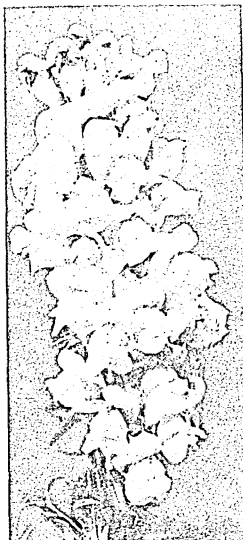
JESSIE MURRAY
CARNATION



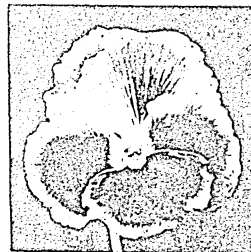
POMPON DAHLIA



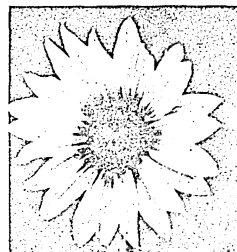
LILY OF THE VALLEY



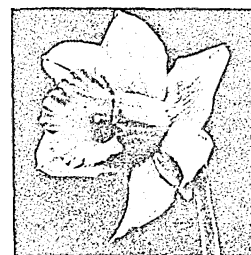
ANTIRRHINUM



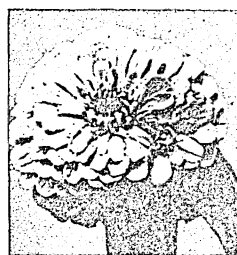
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RED HYBRID SUNFLOWER



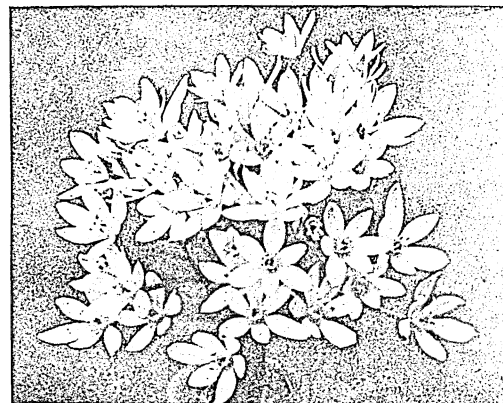
EMPEROR DAFFODIL



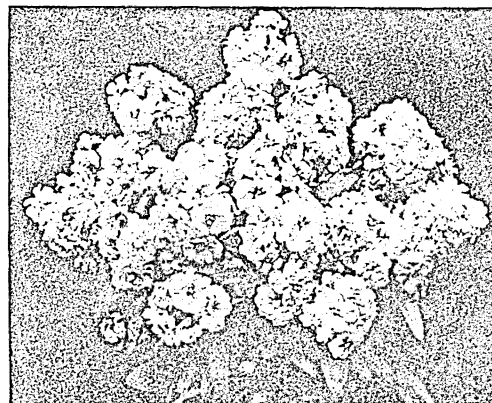
DOUBLE ZINNIA



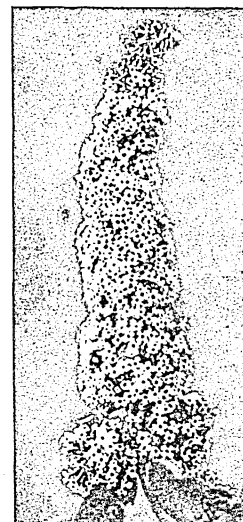
MICHAELMAS DAISY



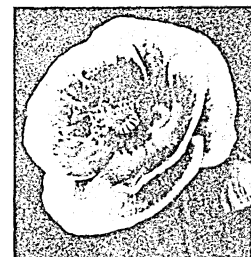
ORNITHOGALUM



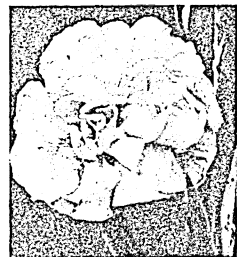
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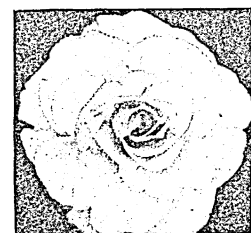
BUDDLEIA



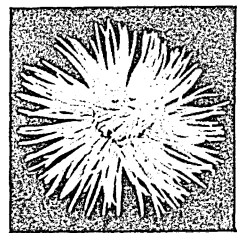
SHIRLEY POPPY



CARNATION



MRS. CAIRNS BEGONIA



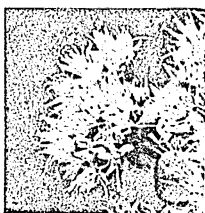
OSTRICH-PLUMED ASTER



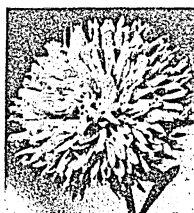
PEARL HYACINTH



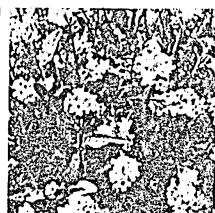
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SEDUM



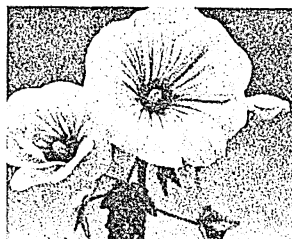
MAMMOTH ASTER



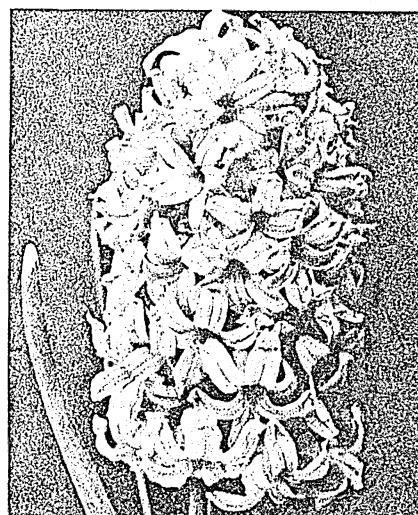
MYOSOTIS



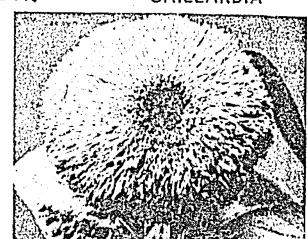
GAILLARDIA



LAVATERA



CITY OF HAARLEM HYACINTH



DOUBLE SUNFLOWER



A BURBANK ROSE



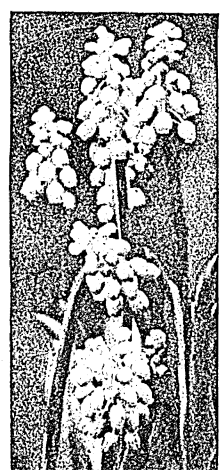
VARIEGATED PERIWINKLE



DOUBLE WALLFLOWER



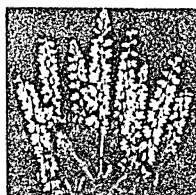
WHITE SPIRAL CANDYTUFT



GRAPE HYACINTH



WINTER ACONITE



LUPIN



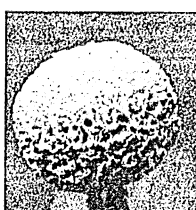
WATER LILY



GODETIA



DOUBLE FUCHSIA



AFRICAN MARIGOLD



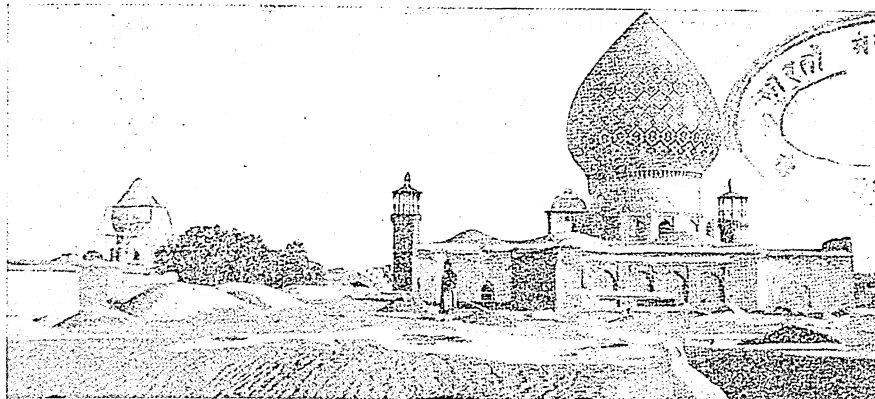
GLADIOLUS



DOROTHY PERKINS ROSE

Many of these flowers are from blooms in the famous Sutton Nurseries at Reading

The Story of the Peoples of All Nations and Their Homelands



The Shah-Chiragh Mosque at Shiraz in Persia

PERSIA AND ITS STORY

PERSIA is one of the countries that has lingered on into modern life, after a period of great military glory followed by long eclipse.

Among the countries that have been ranked as great in the past it is the one that is freest from the conveniences that invention and manufactures have brought to the civilised world. Travel in Persia is unaltered almost everywhere from the most primitive and roadless times. To the stranger the interest in the country is chiefly its old-fashioned methods of travel, by horse, or camel, or donkey, across regions that are chequered with every danger, pathless mountains, dreary deserts (often salt), and a frequent liability to be robbed. It is a land where the nearness of disagreeableness and danger drives away dull monotony.

The relief comes in the form of beautiful fertile vales wherever there is running water. It is this valley-scenery set in the midst of dreary scenery that has given Persia the reputation of a paradise, scented by the rose, made melodious by the nightingale, and offering luscious fruits and nectar to the appetite. Such places may be found, but the way to them is long, monotonous, and rough. The cities, too, that are supposed to be the

country's glory, Ispahan and Teheran, are rather sad instances of grandeur that has seen better days and become tawdry and decayed. The two claims of Persia to attention are adventure for the active man, and "old, unhappy, far-off things and battles long ago" for the lover of romance.

Persia, or Iran, as its people call it, is a lofty plateau seamed by valleys and ridged here and there by mountains; almost wholly mountainous in the west and north-west, but sinking into plains in the north and east, the plains being mostly deserts, and scarcely habitable even for nomadic people. Yet in its towns Persia has some ancient manufactures—silk, carpets, shawls, wool, and felt—and in the country produces wheat, rice, and cotton, fruits, gums, and drugs. It also has considerable supplies of the world's most urgent need for transport purposes in civilised lands—that is, oil.

The area of the country is about 628,000 square miles, or, say, twelve times the size of England. The population is estimated at ten millions. The people, once sun-worshippers according to the creed of Zoroaster, are now almost all Moham-medans of the Shiite sect, whose sacred place is Kerbela in Mesopotamia. The most sacred town within the country is

THE FIVE CONTINENTS & 100 NATIONS & RACES THAT INHABIT THEM

Meshed, in the north-east. The largest cities are Teheran, the present capital, with about 220,000 people; Ispahan, with 90,000, the old capital; Tabriz, with 180,000, the chief inland trading place on the railway from the Black Sea; Meshed, 60,000; Shiraz, 50,000.

A traveller has given us a description of a journey by motor-car through Persia which pictures the country in detail. Round the south of the Caspian, the Garden of Persia, we pass through a paradise of green vegetation of every kind, from rice-fields, shimmering in water, to stretches of daisies, lilies, irises so high that one can easily be lost in them; and everywhere are lovely lilacs and other flowering trees, in which the nightingales sing. But this is only one aspect of Persia, as we soon discover when we push on through the mountain barrier that guards the great plateau of Iran; and we shall be lucky indeed if the car does not break down with bounding from rock to rock or sinking into the stiff mud of the almost neglected roads.

THE LONG AND TIRING JOURNEY ACROSS THE STONY DESERT

If the car does break down, the alternative is to hire a native carriage, without springs, and change horses at the post-houses; and a long and wearisome journey it is, for hotels and inns, as we understand them, are unknown. Day after day we plod along over the stony desert, occasionally relieved by dark forests and spots of cultivation. In the distance we see dry and grim-looking mountains. And the sun pours down in intense heat, so that the caravans with the heavily-loaded camels only travel by night.

It is a relief to see the white-pointed peak of Demavend, and at last to enter Teheran. Under its sky of fixed blue, the roses flower for which Persia is so famous, hedges and gardens with great masses of them, and the fresh, dry air makes us ready to enjoy everything. The palaces and gardens are very fine, also the beautiful lustre pots, and glorious old stuffs, brocades, and carpets that we are invited to buy. And the crowds that pass! These are so different from any we have seen before. Besides the interesting camels and grey donkeys, there are women with long, thick white veils and full black cloaks covering them up completely, and men of different nationalities—Hindus, Turks, Mongols—besides the Persians in

their high black hats and brown flowing robes. The followers of the Prophet are everywhere, in their turbans, sashes, and robes of green; and the mullahs, or priests, are conspicuous in their white headgear among the crowd.

A GARDEN CITY IN THE MIDST OF A DREARY DESERT

But our object is to push on to Ispahan, over many more miles of burning desert, with the sand too hot to touch, though at night the air is crisp and dry, and the deep sky is simply blazing with stars. Every now and then there is the joy of an oasis, with its limpid streams and little village surrounded by fields of corn and rye and cheering wild flowers. When these are passed, there is again the smarting heat, the burnt-out-looking mountains, with their sheer wall of every shade of dull red and dark purple, and not a tree or blade of grass to lighten the desolation.

At last we see the domes of the mosques of Ispahan between the trees, and turning from the bare mountains in the distance, which now look as if bathed in gold, we do not know what to enjoy most. The avenues of trees, the fields of roses and white poppies, the gardens, the pale green streams and canals, the buildings of the great Shah Abbas, which date from the end of the sixteenth century—everything is wonderful and interesting. The enamelled tiles and plaques, the blue cupolas and minarets of the mosque, the fine square, all fill us with admiration; and there are also the immense bazaars where we can buy everything under the sun, and where potters, and weavers of cashmeres and carpets, and leather-workers are all following their interesting and useful trades.

HOW THE CHILDREN LEARN IN THE SCHOOLS OF PERSIA

Europeans are not allowed inside the mosques; but we must not miss the infant school, where the children sit with their Korans on their laps, chanting their lesson, following the lines with little pointing fingers, and swaying themselves backwards and forwards to imitate the Prophet fleeing on his camel.

That is Persia as it is seen today on its one main road past its two capitals. Now we must look at its more romantic past.

The Persians belong to the Aryan-speaking family of nations, from which we ourselves and our neighbours in Europe are descended. Trained in poverty, strong in

body, simple in their lives, they swept down towards the old nations of western Asia, who were weakened by wealth and long prosperity. Some settled between Assyria and the Caspian Sea, and are known to us as the Medes. The first of their kings about whom we can be certain became the ally of Nabopolassar, who led the Babylonians in their final struggle against Assyria. It was this king, Cyaxares, who took Nineveh, and gave the death-blow to the empire of the King of Multitudes, as Ashurbanipal and the rest loved to call themselves. Nabopolassar, who became the founder of the new Babylonian monarchy, had the southern part of the great Assyrian empire for his share, while Cyaxares stretched the boundary of his country of Media away westwards till it touched Asia Minor. The successor to this enlarged Median kingdom was Astyages, who was dethroned by one of the great generals that stand out in the world's history. This was Cyrus, who led the Persians from their mountainous home to a series of brilliant victories.

The Persians were of kindred stock with the Medes. Cyrus was a vassal of Astyages, and after the revolution which made him king of both the Persians and the Medes, the two nations settled down to an equality, and became, to all intents and purposes, one people.

THE WEALTHY CROESUS AND THE ALL-CONQUERING CYRUS

The ambition of Cyrus soon led him to extend his empire over the western part of Asia Minor. There was in Lydia at that time a king so rich that the expression "as rich as Croesus" has passed into a proverbial way of describing a man of great wealth. He did his best to arm his country against the invaders, but his allies failed him, and Cyrus became master of all the part of Asia that is washed by the Black Sea and the Mediterranean.

Then, about 539 years before Christ, came the turn of Babylon! Some of the barrel-shaped cylinders on which Babylonian history is written, and which are now to be seen in the British Museum, tell of the prayers King Nabonidus offered up for himself and his son Belshazzar.

How strange it seems to us! The father honouring the gods, the son carelessly feasting, while the renowned Cyrus, with his army, was actually outside the huge walls. The tawny waters of the Euphrates, which flowed through the city, were

changed from their course, the army poured in by the river-gates, and the conquerers entered without battle, so that the city was spared. Mention is also made of the homage and tribute paid by the inhabitants and peoples round, and how Cyrus pleased the people by restoring the images of the gods to the shrines to which they belonged in other parts of the country. The tablets of this reign and the succeeding ones show that life went on in the city and country much as it had done before the Persian conquest.

THE RELIGION THAT ZOROASTER TAUGHT THE PERSIAN PEOPLE

The religion of the newcomers differed at first very much from that of the Babylonians and Assyrians. It was much simpler and purer, though later it was influenced by idolatries of the elder people.

The famous old faith from the Far East which held the Sun and fire in adoring reverence, as the expression of the All Ruler of the world, was taught to the Medes and Persians by the great Zoroaster.

Cyrus showed much sympathy with the Jews, who also were worshippers of one God, and had been long held captive in the country he had conquered. It was in his day that the joyful processions of the Great Return began to set out across the desert from Babylonia towards the home which they so ardently longed for. As they went, they sang the songs that were impossible for them in the "strange land" of their exile.

After the great Cyrus came his son Cambyses, who wrought much misery and havoc in his own family and in Egypt, where he went as conqueror. Darius the Great, who followed Cambyses, though not of the family of Cyrus, was a vigorous and strong ruler, crushing rebellions as they arose in the various parts of his immense empire, and arranging for its government and good order with ability.

THE STORIES OF OTHER DAYS THAT ARE READ ON THE ROCKS

Much about this king has been learned from tablets and inscriptions found on rocks—chiefly that of the rock of Behistun, which proved such a valuable key to reading the cuneiform writing. The account of the wars and conquests of the great king had to be cut in the Babylonian and Scythic languages as well as in Persian, so that the chief nations under his rule might read and understand. We have,

too, a fine portrait of the king, cut in the rock, receiving the submission of the chiefs of revolted nations, all roped together.

A cylinder seal of the king, giving his name in the three languages, and showing him hunting a lion from his chariot, reminds us of the particulars that we have of this king in the Bible story of Daniel.

THE WORD OF THE KING WHICH COULD NEVER BE BROKEN

On the slabs of the Assyrian kings we can see the cages in which the lions were brought to the hunting-field from dens such as the one into which the aged Daniel was thrown, and a seal—the kind that is rolled over moist clay—is shown, that might well be the one which Darius used to prevent any tampering with the order he had so reluctantly given. The word of the king, once passed, by the laws of the Medes and Persians, could never be broken.

Of late years the sites of the great cities of the Persian Empire have been dug over, and wonderful remains have been found and studied. At Susa, the ancient capital of the Elamites, and at Ecbatana, the great city of the Medes, are found remains of splendid palaces built by Darius and his successors.

From countries round the Indus River the Persian Empire stretched to the Caspian and Mediterranean seas, and far into Egypt, where Darius improved or built a canal from the Nile to the Red Sea. Great roads connecting the various provinces, bridges, inns, watch-towers, were built by his orders, and a royal post was established. Darius also made his way across the Bosphorus into Europe, and across the Danube, extending the boundaries of empire and paving the way for further conquests in the West.

THE SOLEMN WORDS REPEATED TO DARIUS AT HIS FEASTS

For a great struggle was coming on. The provinces in Asia Minor, which Cyrus gained for the Persian Empire, were peopled by Greeks from over the sea of many islands. These people loved freedom, and hated the government of an absolute monarchy. By degrees discontent led to rebellions; rebellions to savage punishments and threats of vengeance. Particularly angry was Darius with the Athenians, who had not only dared to help their fellow-countrymen across the sea, but had refused to submit in any way to the great king.

While he was nursing his plans to make himself absolute master of the revolted states, and of Greece, and perhaps of all Europe beyond, it is said that he had these words said to him three times a day, when he sat at his luxurious feasts: "Master, remember the Athenians."

There was furious fighting with the Greeks of Asia Minor, whose cities were burned, and whose people, often quarrelling among themselves, were overcome by the huge numbers of the army of Darius.

Then Darius remembered the Athenians. He sent an immense army, gathered from all the countries of his empire, under his son-in-law, and they marched over a bridge of boats—as Darius had done before when he went to conquer the Scythians on the Danube. They expected to make short work of the enemy, but the rough seas wrecked their ships, food ran short, and the men of Macedonia and Thrace resisted successfully.

But Darius, with his great wealth and resources, soon fitted out another expedition. This time it sailed across to Greece in 600 ships and landed only a few miles from Athens. It was an awful moment for the Greeks. Great was the excitement, terror, and dismay. But though there were ten times as many Persians as Greeks in the battle of Marathon which followed, the Greeks won the day, and drove back the Persians to their ships. So a second time the Persians had to return home without any glory.

THE GREAT ARMY OF THE SOLDIERS OF FORTY-SIX NATIONS

Darius was more furious and determined than ever when the news of Marathon came to him, and he vowed to take no rest till the Athenians were dragged in chains to Susa. But, in the midst of his plans, Darius died, and his son Xerxes succeeded him. That handsome, gay young man cared more for pleasure and an easy life than for warfare, so that it seemed at first as if the conquest of Greece might be given up. But, in the end, he was persuaded to continue his father's work, and enormous preparations were made for the invasion. It is said that as many as forty-six nations sent their best soldiers, men of all colours—black Africans, and tawny and white natives of far distant parts of Asia. And these soldiers, with their diverse clothing and arms, passed to the war on foot, on horseback, on elephants, on camels, and on ships.

PERSIA AND ITS STORY

Xerxes was in the midst of the host himself, with an immense following of servants and courtiers, surrounded by every sort of luxury that enormous wealth could provide. How changed was all this from the days of his poor and hardy and successful forefathers! It took the army seven days and seven nights to cross the double bridge of boats across the Dardanelles. What a prospect for the Greeks! They heard with terror of this multitude moving ever steadily onwards to overwhelm their small country and its small army; especially as at that time there was so much jealousy among the States that it seemed impossible to get them to act together. The Persians had to pass a ridge of high mountains which protected Athens to the north, and between the bog on the edge of the sea and this high ridge there was a pass near some hot springs. This was the pass of Thermopylae.

A MIGHTY GREEK EPIC AND ITS UNFADING GLORY

Here was fought one of the best and bravest fights in history, one of the few fights where failure was in effect a never-dying victory. A few Greeks held the pass through two days and nights against the hosts of Persians and Medes. These were slain in heaps as they rushed on the solid wall of Greek spears. But a traitor told the Persians of another pass in the mountains, and led the army round by it in the darkness. Some of the Greeks went away; but the little band of Spartans, under Leonidas, determined to conquer or die, and made a final stand, surrounded by overwhelming numbers. All of them were shot down by Persian arrows to the last man. And so Xerxes got to Athens.

Nearly all the inhabitants had fled. He killed the remaining few hundreds, and set fire to the fine buildings, and then marched on to witness the great sea fight from a cliff looking over the Bay of Salamis. No doubt he felt quite certain that his splendid fleet of over a thousand ships, well equipped and manned, would make short work of the small Greek fleet, which numbered only about 350 vessels.

HOW THE GALLANT GREEKS DROVE THE HUGE ARMIES OUT OF EUROPE

As the day wore on, Xerxes became more and more uneasy, and at last started up from his ivory throne, which was carried round with him, in wrath and dismay, as his thousand ships crowded and jostled together in the narrow mouth of the bay,

so that many were run down and sunk. Again and again the loud battle-cry of the Greeks came up to him as they dashed their brazen prows into the ships nearest them, and boarded one after another with the help of their long spears.

Xerxes raved like a madman before night, as he saw his ships, squadron after squadron, turn and sail out to sea. Soon he, too, ran away homewards, and left his general behind with three times as many men as the Greeks could gather, to finish the campaign later. A few months later this remnant of the great host was destroyed and scattered at the battle of Plataea. And so ended the great Persian wars in Europe, when gallant little Greece for twelve years withstood the largest armies the world had ever known.

Artaxerxes, one of the sons of Xerxes, comes into a Bible story, for he had a Jewish cup-bearer, Nehemiah, who was allowed to leave his duties at court and go to help his brethren to rebuild the walls of Jerusalem and reorganise the government of the State.

In the reign of Darius II, another of the sons of Xerxes, Persia lost Egypt, which it had held, in spite of many rebellions, for more than a hundred years. There were other signs that the great empire was beginning to break up.

THE YOUNG KING WHO HIRED GREEK SOLDIERS TO FIGHT HIS BROTHER

Among these signs were dark plots and quarrels between the nobles and princes, which came to a height when two of the sons of Darius II were struggling for the throne. Cyrus, the younger, knowing that Greek soldiers were better than the troops gathered together from different nations in Asia, paid 13,000 Greeks to come and help him fight against his brother. Cyrus was slain and his army defeated near Babylon. The Greeks, now reduced to ten thousand men, fought their way back to the coast amid difficulties under the command of Xenophon, the historian.

For a time Persia revived under a strong king, Artaxerxes III, who subdued Egypt again, and put down many rebellions, but from him the kingdom passed to Darius III, one of the weakest and most unfortunate of rulers. And he had to meet one of the greatest generals the world has produced, Alexander the Great of Greece. Alexander, in the course of his march across Asia to India, met and defeated him and destroyed the Persian Empire.

After Alexander's death his empire was divided between his generals, and one named Seleucus, about 312 B.C., became the Greek king of an independent Persia. Presently, however, a new body of invaders, of the same stock as the Medes and Persians, called Parthians, entered the country from the north, and ruled there for 400 years. However, about 600 years after the conquest of the Persians by Alexander the Great, the Persians threw off the yoke of the Parthians, and a Persian king of the old royal line, named Artaxerxes, founded a real Persian kingdom afresh.

The Persian kings of this line are often called the Sassanian kings. They again raised Persia to greatness. The Parthian idols were cast away; the magi, or wise men, who taught the ancient faith of Zoroaster were gathered together at Persepolis, and the sacred writings, or Bible, of the Persians, called the Zend-Avesta, was written, and some very beautiful teachings are contained in it. So successful were the Sassanian kings in war that by the year 628 their armies had reached the Bosphorus, within a mile of Constantinople, and the Eastern Empire was in the greatest danger from them. But the end of their dynasty came in 639, when the Arab Mohammedans, marching to war in the cause of their religion, overthrew the Persian Power.

THE FAITHFUL ZOROASTRIANS FORM A NEW HOME IN INDIA

The Persian religion was now changed by the Mohammedan rulers, though a few fire-worshippers remained. A number emigrated to India and settled at Bombay, where they are known as Parsees, and are still faithful to their ancient creed.

The Arab Mohammedans, who ruled sometimes in Baghdad and sometimes in Damascus, and whose chiefs were known as the caliphs—the greatest of them being Haroun-al-Raschid—were much attached to the fertile parts of Persia. But a change was at hand. New invaders swept down on Persia from Central Asia, a branch of the Turkish race, and displaced the Arab caliphs both in Persia and Arabia, and ruled from Afghanistan to the Dardanelles.

The Turks had been worse than the Arabs, but their successors were worse than the Turks. These were hordes of Mongols under Genghis Khan, who in the thirteenth century terrorised the world. Persia was conquered, Baghdad taken, and the library of the learning of the caliphs was burned.

A generation later another Mongol horde under Tamerlane burst over the country, and preyed on it so that its prosperity became only a memory. However, in the year 1500, a new ruler arose in Western Persia, and, taking the old title of Shah, formed a national government, and reduced the Mongols to submission. He is looked upon by Persians as the founder of modern Persia. His name was Ismail. He engaged in war not unsuccessfully with the Sunni sect of Mohammedans, and so is specially venerated by the Persians, who, like him, are of the Shiah sect.

THE GREATEST PERSIAN RULER IN THE COUNTRY'S MODERN HISTORY

Some strong Shahs follow, particularly Shah Abbas I, the Great, who died in 1628. He it was who built and beautified Ispahan as his capital. A wise and just monarch, he paid great attention to trade, and ruled from Afghanistan to Armenia.

His successors, however, failed to imitate his toleration in religion, and attempts at persecution led to religious warfare, during which the Afghans captured Ispahan, and one of them, Mahmud, succeeded to the throne. Generally speaking, the government of Persia during the nineteenth century was feeble, and order was nowhere ensured. The country had an air of decay.

Up to 1906 the Shah remained an autocrat, checked only by the chief doctors of law living at the places of pilgrimage of the Shiah Moslems, Najaf and Kerbela, in Mesopotamia. But in 1906 a constitution was drawn up to enable a representative government to be formed. Since then a National Assembly has met several times, but the government of the country was carried on by a Cabinet acting through the governor-generals of the thirty-three provinces, and in practice there was very little change up to the time these pages went to press.

A NEW ANCIENT RACE WHICH SHOWS NO DESIRE FOR PROGRESS

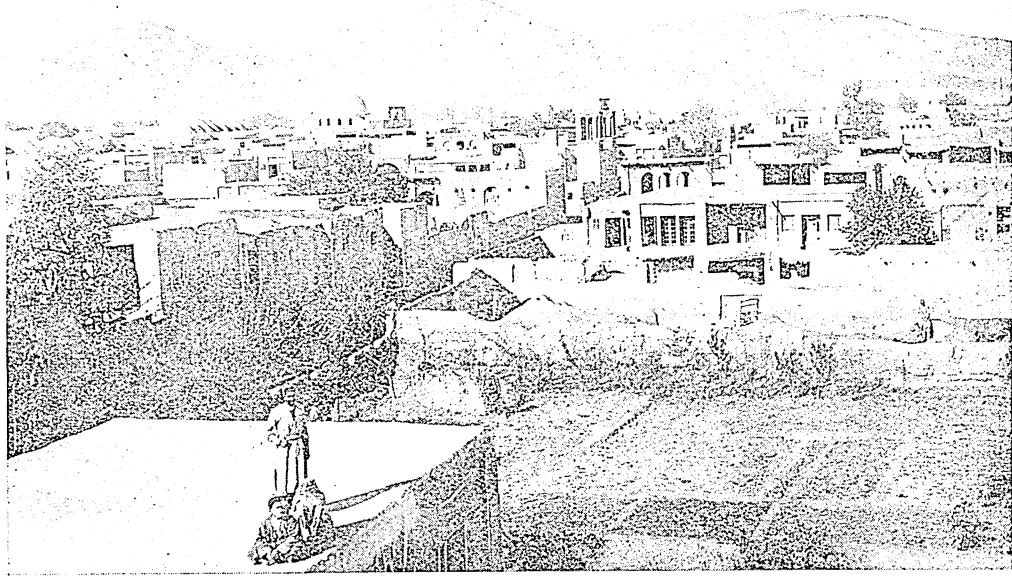
But Persia has a new importance in her reserves of oil in the regions adjoining Mesopotamia. During the war she was strongly influenced by Great Britain, and her actions were friendly.

Whether races like the Persians, once famous, retain enough vitality to absorb the new knowledge that is being gained by the world, and to use it for the betterment of their country, is a question only the future can answer, but at present there are few signs of a desire for progress.

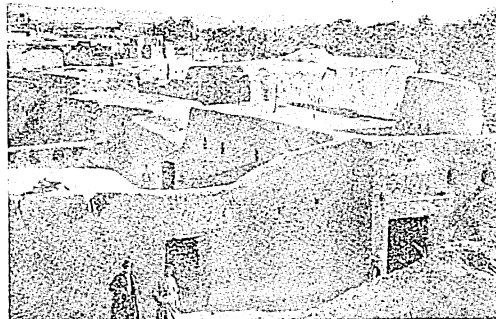
PICTURES AND MAPS OF PERSIA



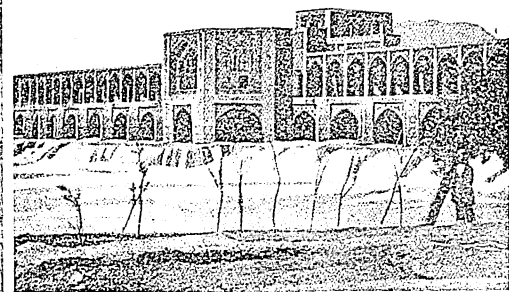
THE PAGEANTRY OF THE EAST—FROM THE PAINTING OF INDIA AND PERSIA, BY ALBERT HERTER



THE OLD TOWN OF SULTANABAD IN THE PROVINCE OF KHORASSAN



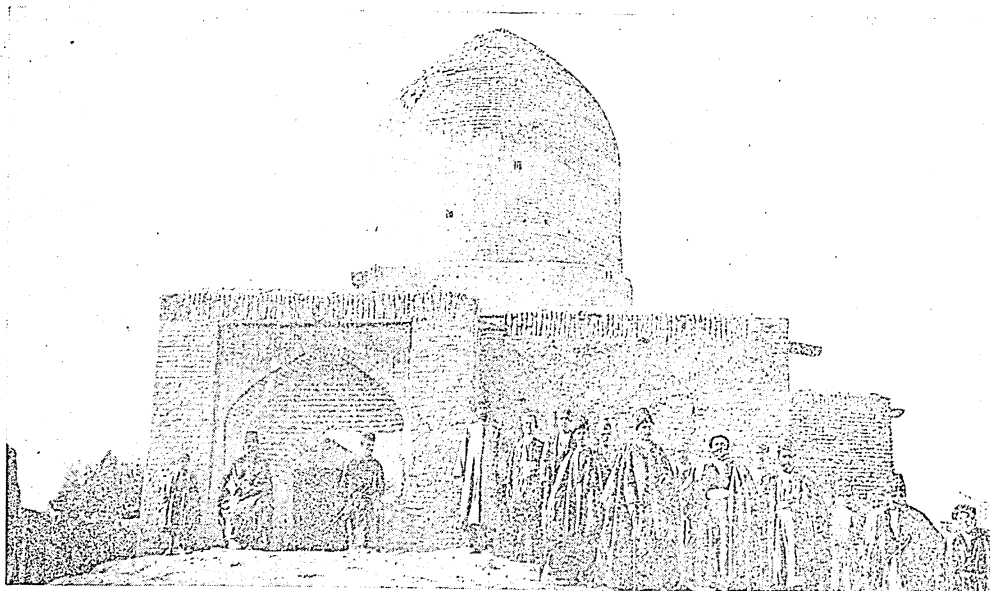
THE TOWN OF DIZFUL IN ARABISTAN



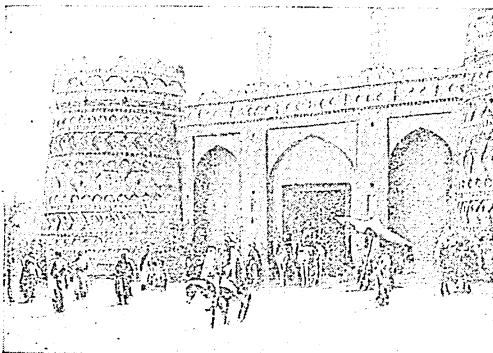
A SPLENDID BRIDGE AT ISPAHAN



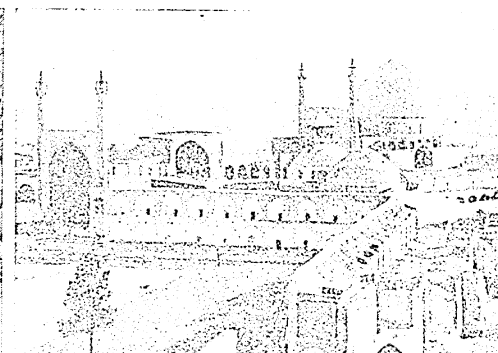
THRESHING CORN WITH THE AID OF DONKEYS



THE SUPPOSED TOMB OF ESTHER AND MORDECAI AT HAMADAN



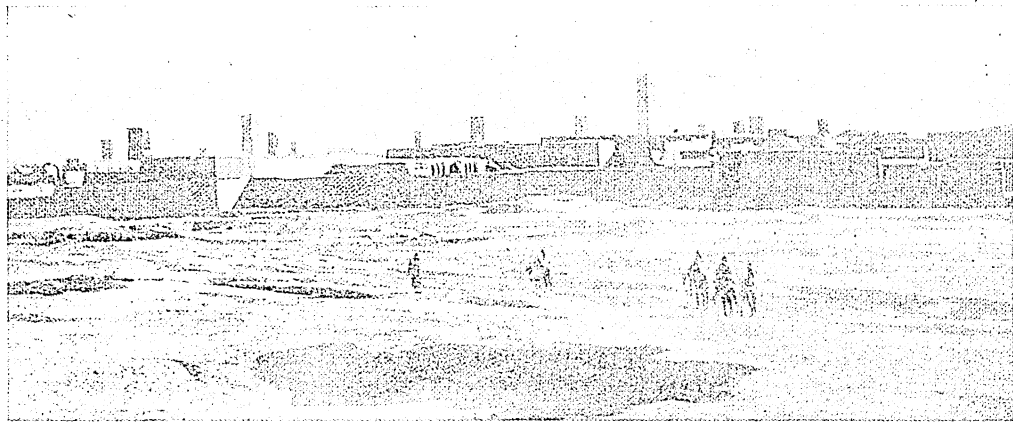
ONE OF THE CITY GATES OF KERMAN



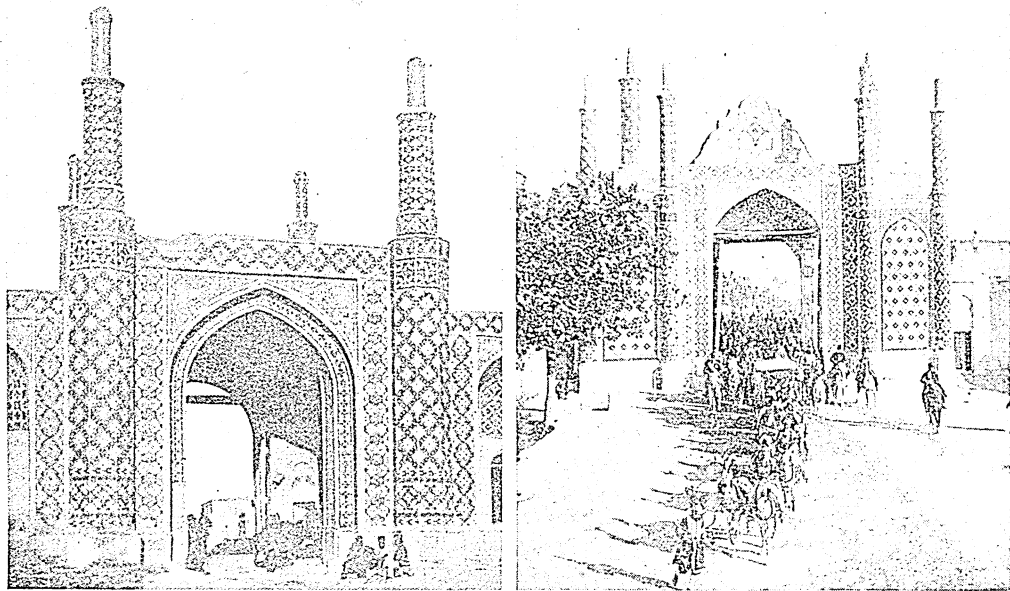
THE GRAND MOSQUE AT ISPAHAN



A QUAINB BULLOCK CART SEEN ON THE ROADS OF PERSIA



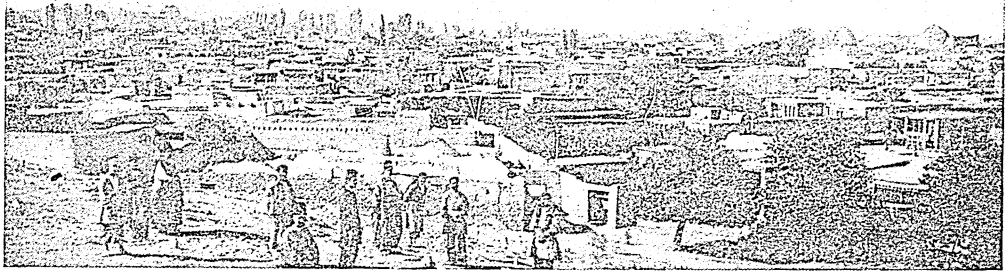
THE SQUARE TOWERS AND FLAT ROOFS OF YEZD



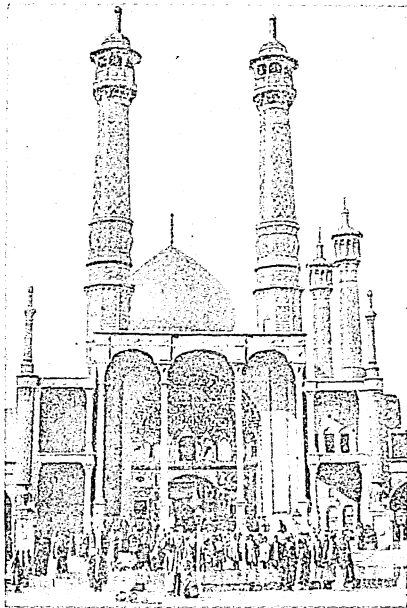
TWO OF THE BEAUTIFUL GATES LEADING TO THE CITY OF TEHERAN



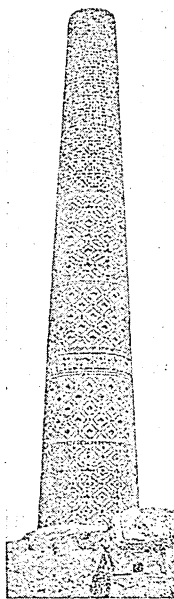
LOOKING DOWN ON TEHERAN THE CAPITAL OF PERSIA



THE CITY OF HAMADAN, CAPITAL OF THE PROVINCE OF HAMADAN.



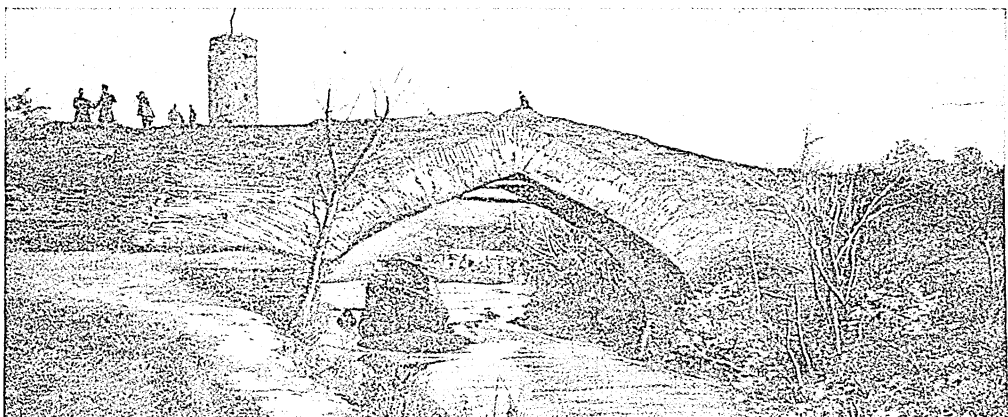
THE MOSQUE KNOWN AS FATIMA'S SHRINE AT KUM



THE MINAR AT DAMGHAN



THE ENTRANCE TO THE GOVERNOR'S HOUSE AT SHIRAZ



AN ANCIENT BRIDGE AT RESHT. CAPITAL OF THE PERSIAN PROVINCE OF GILAN



A LADY IN INDOOR COSTUME



A PERSIAN SCRIBE



A PEASANT GIRL OF SHIRAZI



WEAVING MATS IN A PERSIAN VILLAGE



A BAND OF LITTLE WATER-CARRIERS



A PERSIAN MULLAH, OR
TEACHER



KURDISH WOMEN OF THE
UPLANDS



A TYPICAL OLD
PERSIAN MERCHANT



AT WORK IN THE HARVEST FIELDS



A DEVOUT PERSIAN AT PRAYER



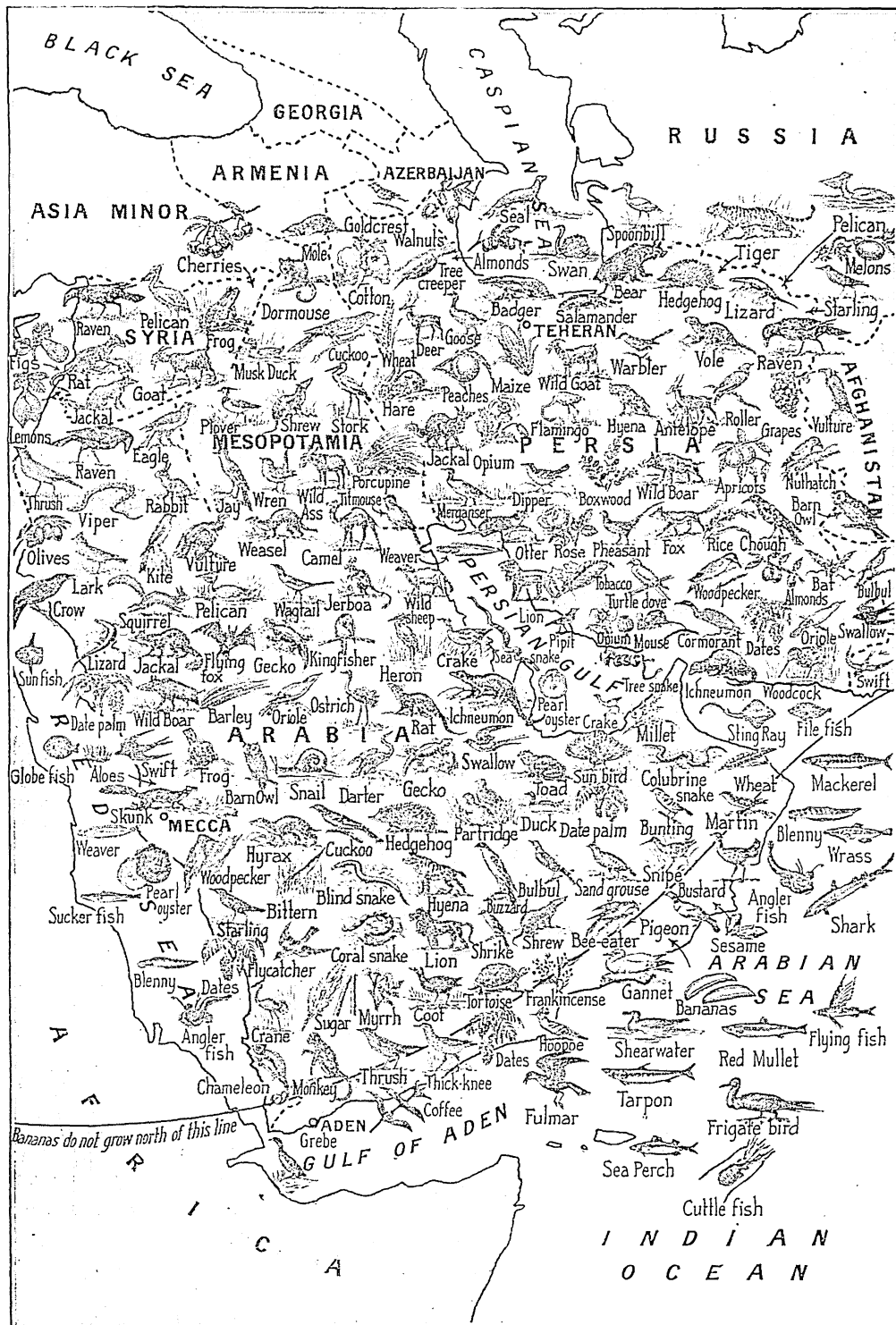
TWO PERSIAN DERVISHES



A WRITING LESSON

Our Persia pictures are reproduced by courtesy of the Church Missionary Society, the E.N.A., Mr. Avezatze, and others

THE ANIMALS OF FOUR ANCIENT LANDS



ALTHOUGH THERE IS SO MUCH DESERT LAND IN SYRIA, MESOPOTAMIA, ARABIA, AND PERSIA
YET THEIR ANIMAL LIFE IS VERY VARIED AS SHOWN HERE

FOUR COUNTRIES OF THE NEAR EAST



THIS MAP GIVES A BIRD'S-EYE VIEW OF SYRIA, MESOPOTAMIA, ARABIA, AND PERSIA, AND SHOW THE CHIEF TOWNS AND RIVERS

One Thousand Poems of All Times and All Countries



THE DREAM OF EUGENE ARAM

In 1745 a Yorkshire schoolmaster named Eugene Aram killed a man to gain his goods. The disappearance of the man led to his being suspected of swindling, and Aram was tried as his accomplice, but acquitted. Fourteen years later, while Aram was teaching in a school at King's Lynn, the body of his victim was found, and he was tried for murder

and condemned to death. Aram was a very clever man, a fine scholar, and not at all the kind of person one would suspect of so terrible a crime. The story of his dream is fiction; but in this great and grim poem by Thomas Hood we see how consciousness of guilt may work on the human mind and may even become the agent of justice.

'Twas in the prime of summer time,
An evening calm and cool,
And four-and-twenty happy boys
Came bounding out of school:
There were some that ran and some that
leapt,
Like troutlets in a pool.

Away they sped with gamesome minds,
And souls untouched by sin;
To a level mead they came, and there
They drave the wickets in:
Pleasantly shone the setting sun
Over the town of Lynn.

Like sportive deer they coursed about,
And shouted as they ran,
Turning to mirth all things of earth,
As only boyhood can:
But the usher sat remote from all,
A melancholy man!

His hat was off, his vest apart,
To catch heaven's blessed breeze;
For a burning thought was in his brow,
And his bosom ill at ease:
So he leaned his head on his hands, and
read
The book between his knees!

Leaf after leaf he turned it o'er,
Nor ever glanced aside;
For the peace of his soul he read that book
In the golden eventide;

Much study had made him very lean,
And pale, and leaden-eyed.

At last he shut the ponderous tome;
With a fast and fervent grasp
He strained the dusky covers close,
And fixed the brazen hasp:
"O God, could I so close my mind,
And clasp it with a clasp!"

Then, leaping on his feet upright,
Some moody turns he took;
Now up the mead, then down the mead,
And past a shady nook:
And lo! he saw a little boy
That pored upon a book!

My gentle lad, what is't you read,
Romance or fairy fable?
Or is it some historic page,
Of kings and crowns unstable?
The young boy gave an upward glance:
"It is The death of Abel."

The usher took six hasty strides,
As smit with sudden pain;
Six hasty strides beyond the place,
Then slowly back again;
And down he sat beside the lad,
And talked with him of Cain;

And, long since then, of bloody men.
Whose deeds tradition saves;
Of lonely folk cut off unseen,
And hid in sudden graves;

POEMS · SONGS · BALLADS · VERSES AND RHYMES WITH MUSIC

Of horrid stabs in groves forlorn,
And murders done in caves ;
And how the sprites of injured men
Shriek upward from the sod ;
Ay, how the ghostly hand will point
To show the burial clod ;
And unknown facts of guilty acts
Are seen in dreams from God !

He told how murderers walked the earth
Beneath the curse of Cain,
With crimson clouds before their eyes,
And flames about their brain :
For blood has left upon their souls
Its everlasting stain !

" And well," quoth he, " I know for truth
Their pangs must be extreme,
Woe, woe, unutterable woe,
Who spill life's sacred stream !
For why ? Methought last night I wrought
A murder in a dream !

" One that had never done me wrong,
A feeble man, and old ;
I led him to a lonely field,
The moon shone clear and cold :
Now here, said I, this man shall die,
And I will have his gold !

" Two sudden blows with a ragged stick,
And one with a heavy stone,
One hurried gash with a hasty knife,
And then the deed was done :
There was nothing lying at my foot
But lifeless flesh and bone !

" Nothing but lifeless flesh and bone,
That could not do me ill ;
And yet I feared him all the more
For lying there so still :
There was a manhood in his look
That murder could not kill !

" And lo ! the universal air
Seemed lit with ghastly flame,
Ten thousand thousand dreadful eyes
Were looking down in blame :
I took the dead man by the hand,
And called upon his name.

" Oh, God ! it made me quake to see
Such sense within the slain !
But when I touched the lifeless clay
The blood gushed out again !
For every clot a burning spot
Was scorching in my brain !

" My head was like an ardent coal,
My heart as solid ice ;
My wretched, wretched soul, I knew,
Was at the devil's price :

A dozen times I groaned ; the dead
Had never groaned but twice.

" And now, from forth the frowning sky,
From the heaven's topmost height,
I heard a voice—the awful voice
Of the blood-avenging Sprite :
' Thou guilty man ! take up thy dead,
And hide it from my sight.'

" I took the dreary body up,
And cast it in a stream,
A sluggish water black as ink,
The depth was so extreme.
My gentle boy, remember this
Is nothing but a dream !

" Down went the corpse with a hollow
plunge,
And vanished in the pool !
Anon I cleansed my bloody hands,
And washed my forehead cool,
And sat among the urchins young
That evening in the school !

" Oh, heaven ! to think of their white
souls,
And mine so black and grim !
I could not share in childish prayer,
Nor join in evening hymn :
Like a devil of the pit I seemed
'Mid holy cherubim !

" And peace went with them, one and all,
And each calm pillow spread,
But Guilt was my grim chamberlain
That lighted me to bed,
And drew my midnight curtains round
With fingers bloody red !

" All night I lay in agony,
In anguish dark and deep ;
My fevered eyes I dare not close,
But stared aghast at Sleep ;
For Sin had rendered unto her
The keys of hell to keep !

" All night I lay in agony,
From weary chime to chime,
With one besetting horrid hint,
That racked me all the time :
A mighty yearning, like the first
Fierce impulse unto crime !

" One stern tyrannic thought, that made
All other thoughts its slave ;
Stronger and stronger every pulse
Did that temptation crave,
Still urging me to go and see
The dead man in his grave !

" Heavily I rose up, as soon
As light was in the sky,

POETRY

And sought the black accursèd pool
With a wild misgiving eye;
And I saw the dead in the river bed,
For the faithless stream was dry!

"Merrily rose the lark, and shook
The dew-drop from its wing;
But I never marked its morning flight,
I never heard it sing:
For I was stooping once again
Under the horrid thing.

"With breathless speed, like a soul in
chase,
I took him up and ran;
There was no time to dig a grave
Before the day began;
In a lonesome wood, with heaps of leaves,
I hid the murdered man;

"And all that day I read in school,
But my thought was other-where;
As soon as the mid-day task was done
In secret I was there;
And a mighty wind had swept the leaves,
And still the corse was bare!

"Then down I cast me on my face,
And first began to weep,
For I knew my secret then was one
That earth refused to keep:
Or land or sea, though he should be
Ten thousand fathoms deep.

"So wills the fierce avenging Sprite,
Till blood for blood atones!
Ay, though he's buried in a cave,
And trodden down with stones,
And years have rotted off his flesh,
The world shall see his bones!

"Oh, God, that horrid, horrid dream
Besets me now awake!
Again—again, with dizzy brain,
The human life I take;
And my red right hand grows raging hot,
Like Cranmer's at the stake.

"And still no peace for the restless clay
Will wave or mould allow;
That horrid thing pursues my soul,
It stands before me now!"
The fearful boy looked up, and saw
Huge drops upon his brow!

*That very night, while gentle sleep
The urchin's eyelids kissed,
Two stern-faced men set out from Lynn,
Through the cold and heavy mist;
And Eugene Aram walked between,
With gyves upon his wrist.*

MOTHER EARTH HAS ROOM FOR ALL
Friedrich Schiller, who was born in 1759 and died in 1805, ranks with his friend Goethe. They are the two great poets and dramatists of Germany. He was also distinguished as a critic and historian. In these verses he shows how his heart was large enough to embrace all living creatures and denounce the so-called sport that has death as its goal.

WILT thou leave the lambs untended?
See how happily they play
By the brook, and crop the blended
Grasses starred with blossoms gay.
"Mother, mother, let me go
To the mountains with my bow!"

From the dells the cattle calling,
Sound upon thy merry horn.
Hark, the cow-bell's echo falling
Fainter o'er the forest borne.
"Mother, mother, let me go
Hunting with my trusty bow!"

Stay and tend the simple flowers
Blooming in our garden here.
On the heights no fragrant bowers
Greet thee—all is wild and drear.
"Nay, the flowers alone can grow;
Mother, mother, let me go!"

And he dashes off unheeding,
Blindly, bent upon the chase,
Ever madly onwards speeding
Up the gloomy mountain-face;
While before him like a wind
Darts the trembling chamois hind.

Up the barren precipices
Light of foot she finds a way,
Over fathomless abysses
Leaping—naught her flight can stay;
Hard upon her track the foe
Follows with his deadly bow.

Till at last she pauses, driven
To the mountain's topmost ridge,
Where a monstrous gorge is riven
That no leap may hope to bridge;
There she clings, with cruel death
Close behind, the gulf beneath.

Then she turns on him with yearning,
Mutely-pleading eyes of woe:
Vainly, for, all pity spurning,
Even now he draws his bow—
When from out the gulf, behold,
Steps the Mountain Spirit old.

And his mighty hand extending
O'er the hunter's destined prize,
"Even unto me ascending
Bring'st thou pain and death?" he
cries.
"Mother Earth has room for all;
Must my flock before thee fall?"

POETRY

WHEN I AM DEAD, MY DEAREST

Christina Rossetti, the sister of Dante Gabriel Rossetti, was a poet who made her verses more flowing and less studied than those of her brother. He wrote a sonnet on the subject of this song but it had not the rare sweetness of these lines.

WHEN I am dead, my dearest,
Sing no sad songs for me :
Plant thou no roses at my head,
Nor shady cypress tree :
Be the green grass above me
With showers and dewdrops wet :
And if thou wilt, remember,
And if thou wilt, forget.

I shall not see the shadows,
I shall not feel the rain ;
I shall not hear the nightingale
Sing on as if in pain :
And dreaming through the twilight
That doth not rise nor set,
Haply I may remember,
And haply may forget.

GREENSLEEVES

This ballad of unrequited love was very popular in the time of Shakespeare. Probably it was winged on its way as a song of the time by a popular tune, for the tune is mentioned in *The Merry Wives of Windsor* as if it were all the vogue

*Greensleeves was all my joy,
Greensleeves was my delight,
Greensleeves was my heart of gold,
And who but Ladye Greensleeves ?*

Alas, my love, ye do me wrong,
To cast me off discourteously ;
And I have loved you so long,
Delighting in your company !

My gayest gelding I thee gave,
To ride wherever liked thee ;
No lady ever was so brave,
And yet thou wouldest not love me.

My men were clothed all in green,
And they did ever wait on thee ;
All this was gallant to be seen,
And yet thou wouldest not love me.

They set thee up, they took thee down,
They served thee with humility ;
Thy foot might not once touch the ground,
And yet thou wouldest not love me.

For every morning, when thou rose,
I sent thee dainties, orderly ;
To cheer thy stomach from all woes,
And yet thou wouldest not love me.

Well ! I will pray to God on high
That thou my constancy may'st see,
And that, yet once before I die,
Thou wilt vouchsafe to love me.

Greensleeves, now farewell, adieu !
God I pray to prosper thee !
For I am still thy lover true ;
Come once again and love me !

*Greensleeves was all my joy,
Greensleeves was my delight,
Greensleeves was my heart of gold,
And who but Ladye Greensleeves ?*

INTO THE WOODS MY MASTER WENT

This tender suggestion of close sympathy between Jesus and Nature is by Sidney Lanier, an American poet of high promise who died when comparatively young.

INTO the woods my Master went,
Clean forspent, forspent.
Into the woods my Master came,
Forspent with love and shame.
But the olives they were not blind to Him,
The little grey leaves were kind to Him,
The thorn-tree had a mind to Him,
When into the woods He came:

Out of the woods my Master went,
And He was well content.
Out of the woods my Master came,
Content with death and shame.
When Death and Shame would woo Him
last,
From under the trees they drew Him last,
'Twas on a tree they slew Him—last
When out of the woods He came.

THE VAGABOND

This poetic revelation of the mind of the casual wanderer in love with the freedom of the open air is from the pen of John Drinkwater, the living poet and dramatist, who wrote the famous play of Abraham Lincoln. The poem is the copyright of Sidgwick and Jackson, publishers

I KNOW the pools where the grayling rise,
I know the trees where the filberts fall,
I know the woods where the red fox lies,
The twisted elms where the brown owls
call.
And I've seldom a shilling to call my own,
And there's never a girl I'd marry.
I thank the Lord I'm a rolling stone
With never a care to carry.

I talk to the stars as they come and go
On every night from July to June ;
I'm free of the speech of the winds that
blow,
And I know what weather will sing what
tune.

I sow no seed and I pay no rent,
And I thank no man for his bounties,
But I've a treasure that's never spent,
I'm lord of a dozen counties.

POETRY

TODAY

Thomas Carlyle was deeply impressed by the idea of Time. Here he puts some of his impressions into rhyme, making them useful as warnings but insignificant as verse.

So here hath been dawning
Another blue day :
Think wilt thou let it
Slip useless away ?

Out of Eternity
This new day was born ;
Into Eternity
At night will return.

Behold it aforetime
No eye ever did ;
So soon it for ever
From all eyes is hid.

Here hath been dawning
Another blue day :
Think wilt thou let it
Slip useless away ?

TO ALTHEA, FROM PRISON

This graceful lyric by Richard Lovelace, a Royalist poet of the reign of Charles the First, was written in prison to his lady-love. Its gay strains finally merge into serious truth.

WHEN Love with unconfined wings
Hovers within my gates,
And my divine Althea brings
To whisper at the grates ;
When I lie tangled in her hair
And fettered to her eye,
The birds that wanton in the air
Know no such liberty.

When flowing cups run swiftly round
With no allaying Thames,
Our careless heads with roses bound,
Our hearts with loyal flames ;
When thirsty grief in wine we steep,
When healths and draughts go free,
Fishes that tinkle in the deep
Know no such liberty.

When, like committed linnets, I
With shriller throat shall sing
The sweetness, mercy, majesty,
And glories of my king ;
When I shall voice aloud how good
He is, how great should be,
Enlargèd winds, that curl the flood,
Know no such liberty.

Stone walls do not a prison make,
Nor iron bars a cage ;
Minds innocent and quiet take
That for an hermitage ;
If I have freedom in my love
And in my soul am free,
Angels alone, that soar above,
Enjoy such liberty.

WEST LONDON

This striking sonnet by Matthew Arnold is in its first eight lines a fine example of condensed and vivid description. The street picture of the begging family is complete in spectacle and in feeling. But the moral drawn in the last six lines is not as natural as the picture painted. It was not pride that made the woman beg of the poor rather than of the rich. Experience had taught her it is the poor who give quickest sympathy to the pain of poverty.

CROUCHED on the pavement close by
Belgrave Square
A tramp I saw, ill, moody, and tongue-
tied ;
A babe was in her arms, and at her side
A girl ; their clothes were rags, their feet
were bare.

Some labouring men, whose work lay
somewhere there,
Passed opposite ; she touched her girl,
who hied
Across, and begged, and came back satis-
fied.

The rich she had let pass with frozen stare.

Thought I : " Above her state this spirit
towers ;

She will not ask of aliens, but of friends,
Of sharers in a common human fate.

" She turns from that cold succour, which
attends

The unknown little from the unknowing
great,

And points us to a better time than ours."

HE IS NOT A POET

Wilfred Scawen Blunt, Sussex squire, traveller, poet, and politician, died at an advanced age in 1923. He had led an adventurous life. The sixteen lines that follow tell of his boyish aims, his longing for a life of adventure. They are not quite sincere, for Blunt succeeded best as a poet.

I WOULD not, if I could, be called a poet.
I have no natural love of the chaste
muse.

If aught be worth the doing I would do it ;
And others, if they will, may tell the news.
I care not for their laurels, but would
choose

On the world's field to fight or fall or run.
My soul's ambition would not take excuse
To play the dial rather than the sun.

The faith I held I hold, as when a boy
I left my books for cricket-bat and gun.
The tales of poets are but scholars'
themes.

In my hot youth I held it that a man
With heart to dare and stomach to enjoy
Had better work to his hand in any plan
Of any folly, so the thing were done,
Than in the noblest dreaming of mere
dreams.

THE EVE OF SAINT MARK

John Keats published volumes of poems in 1817 and 1820, and wrote a number of poems that were not published till after his death, in 1821. The poem which follows is a fragment found among the poet's papers. No doubt it was the beginning of a tale. The legend of St. Mark's Day is that the wraiths of people who are in peril of death accompany them to church on that day. If their ghost comes out with them they will live; if it remains behind in the church they are doomed. Probably the poet was about to introduce this legend, for there was a version of it among his notes. All we have in the poem is a description of people going to church decorously in a romantic old city, while a young girl reads from a quaint ancient volume. Every line gives a clear picture with a suggestion of romance in it. The poem is one of the most fascinating of literary fragments

UPON a Sabbath day it fell;
Twice holy was the Sabbath bell
That called the folk to evening prayer;
The city streets were clean and fair
From wholesome drench of April rains;
And, on the western window panes,
The chilly sunset faintly told
Of unmaturing green valleys cold,
Of the green, thorny, bloomless hedge,
Of rivers new with spring-tide sedge,
Of primroses by sheltered rills,
And daisies on the aguish hills.
Twice holy was the Sabbath bell:
The silent streets were crowded well
With staid and pious companies,
Warm from their fireside oratories;
And moving, with demurest air,
To evensong and vesper prayer.
Each arched porch and entry low
Was filled with patient folk and slow,
With whispers hush and shuffling feet,
While played the organ loud and sweet.

The bells had ceased, the prayers begun,
And Bertha had not yet half done
A curious volume, patched and torn,
That all day long, from earliest morn,
Had taken captive her two eyes
Among its golden broideries;
Perplexed her with a thousand things:
The stars of Heaven, and angels' wings,
Martyrs in a fiery blaze,
Azure saints in silver rays,
Moses' breastplate, and the seven
Candlesticks John saw in Heaven,
The winged Lion of Saint Mark,
And the Covenantal Ark,
With its many mysteries,
Cherubim and golden mice.

Bertha was a maiden fair,
Dwelling in the old Minster square;
From her fireside she could see,
Sidelong, its rich antiquity,
Far as the Bishop's garden wall;
Where sycamores and elm trees tall,

Full-leaved, the forest had outstript,
By no sharp north wind ever nipt,
So sheltered by the mighty pile.
Bertha arose, and read awhile,
With forehead 'gainst the window-pane.
Again she tried, and then again,
Until the dusk eve left her dark
Upon the legend of Saint Mark.
From plaited lawn-frill, fine and thin,
She lifted up her soft warm chin,
With aching neck and swimming eyes,
And dazed with saintly imageries.

All was gloom, and silent all,
Save now and then the still footfall
Of one returning homewards late,
Past the echoing minster gate.

The clamorous daws that all the day
Above tree-tops and towers play,
Pair by pair had gone to rest,
Each in its ancient belfry nest,
Where asleep they fall betimes
To music of the drowsy chimes.

All was silent, all was gloom,
Abroad and in the homely room:
Down she sat, poor cheated soul!
And struck a lamp from the dismal coal;
Leaned forward, with bright drooping hair
And slant book, full against the glare.
Her shadow, in uneasy guise,
Hovered about, a giant size,
On ceiling-beam and old oak chair,
The parrot's cage, and panel square;
And the warm angled winter screen,
On which were many monsters seen,
Called doves of Siam, Lima mice,
And legless birds of Paradise,
Macaw, and tender Avadavat,
And silken-furred Angora cat.
Untired she read, her shadow still
Glowered about, as it would fill
The room with wildest forms and shades,
As though some ghostly queen of spades
Had come to mock behind her back,
And dance, and ruffle her garments black.

Untired she read the legend page
Of holy Mark, from youth to age,
On land, on sea, in pagan chains,
Rejoicing for his many pains.
Sometimes the learned eremite,
With golden star, or dagger bright,
Referred to pious poesies
Written in smallest crow-quill size
Beneath the text; and thus the rhyme
Was parcelled out from time to time:
"Als writith he of swevenis,
Men han beforne they wake in bliss,

POETRY

Whanne that hir friendes thinke hem
bound

In crimped shroude farre under grounde ;
And how a litling child mote be
A saint er its nativitie,
Gif that the modre (God her blesse !)
Kepen in solitarinesse,
And kissen devoute the holy croce.
Of Goddes love, and Sathan's force,
He writith ; and thinges many mo
Of swiche thinges I may not show.
Bot I must tellen verilie
Somdel of Saintè Cicilie,
And chieffie what he auctorethe
Of Saintè Markis life and dethe."

At length her constant eyelids come
Upon the fervent martyrdom ;
Then lastly to his holy shrine,
Exalt amid the tapers' shine
At Venice,—

THE SOLE BIDDER

The fleetingness of time and pleasure are here contrasted by Harold Begbie, in a homely way, with the lasting power of noble sacrifice through love. All are willing to buy pleasure, but who will bid for the crown of thorns ?

THE company was gathered,
And Life, the auctioneer,
Stands up before the bidders,
His hammer lying near.
" Lot One," he cries, " I offer
Is Time that's passing on,
And Time, my friends, remember,
Is going, going : *gone !* "

Two bidders fight to buy it,
But not with gold accurst :
They offer all their efforts,
Their hunger and their thirst.
One means to use it nobly,
The other for his boast ;
The hammer falls—he had it
Who longed to get it most.

Once more the crowd sways forward,
And Life, with hammer high,
Puts up the lots of Satan,
All things that rot and die,
Rich dainties for the palate,
Proud, garish things to don ;
With sin and shame men buy them,
Hark ! Going, going : *gone !*

And now cries Life, " I offer
A thing that Mammon scorns,
Yet centuries have praised it—
Last lot, a crown of thorns."
Ah, most have spent their fortunes,
One laughs, another fears ;
Love bows his head, sole bidder,
And buys it with his tears.

THE WORLD'S MAY QUEEN

We must expect our poets to attribute choice qualities to their own land. It is the universal habit of poets of all nations. In these lines, which form the second stanza of a longer poem, Alfred Noyes makes Spring choos England from all countries as her permanent May Queen. It is a daring choice, considering our weather, but we hope it is true. Anyway, Mr. Noyes should know, for he is one of the most travelled of our poets, and an excellent poet too.

WHEN Spring comes back to England
And crowns her brows with May,
Round the merry moonlit world
She goes the greenwood way ;
She throws a rose to Italy,
A fleur-de-lys to France ;
But round her regal morris-ring
The seas of England dance.

When Spring comes back to England
And dons her robe of green,
There's many a nation garlanded,
But England is the Queen ;
She's Queen, she's Queen of all the world
Beneath the laughing sky,
For the nations go a-Maying
When they hear the New Year cry :

" Come over the water to England,
My old love, my new love,
Come over the water to England,
In showers of flowery rain ;
Come over the water to England,
April, my true love ;
And tell the heart of England
The Spring is here again ! "

CONTENT

Pleas for quietness and contentment, with the modest ambitions of the simple life, abound in early English poetry. This is an example from Robert Greene, a 16th-century poet.

SWEET are the thoughts that savour
of content ;
The quiet mind is richer than a crown ;
Sweet are the nights in careless slumber
spent ;
The poor estate scorns Fortune's angry
frown.
Such sweet content, such minds, such
sleep, such bliss,
Beggars enjoy when princes oft do miss.
The homely house that harbours quiet
rest ;
The cottage that affords no pride, nor
care ;
The mean that 'grees with country music
best ;
The sweet consort of mirth and music's
fare ;
Obscurèd life sets down a type of bliss,
A mind content both crown and king-
dom is.

NOW THANK WE ALL OUR GOD

Martin Rinkart, who wrote this fine hymn of thanks giving, was a German pastor who lived from 1586 to 1649, through a period of great suffering, and yet kept a joyful heart. He was a brave man in face of war and pestilence. The translator, Miss Catherine Winkworth (1829-1878) issued her English version of German hymns in 1858. The tune (Wittenburg) to which the hymn is usually sung is German, by Johann Cruger, and was contemporary with the hymn and probably written specially for it.

Now thank we all our God,
With heart, and hands, and voices,
Who wondrous things hath done,
In Whom His world rejoices ;
Who from our mothers' arms
Hath blessed us on our way
With countless gifts of love,
And still is ours today.

O may this bounteous God
Through all our life be near us,
With ever joyful hearts
And blessed peace to cheer us ;
And keep us in His grace,
And guide us when perplexed,
And free us from all ills
In this world and the next.

All praise and thanks to God
The Father now be given,
The Son, and Him who reigns
With them in highest heaven,
The One Eternal God,
Whom earth and heaven adore,
For thus it was, is now,
And shall be evermore.

I STOOD AND WATCHED

This poetic fancy, which appeared in an American newspaper, tells very prettily the triumph of faith ; for without faith in the goodness and mercy of God many other virtues will not help us greatly. That, at least, is the message of this poem taken from the pages of a far-away newspaper.

I stood and watched my ships go out,
Each, one by one, unmooring, free,
What time the quiet harbour filled
With flood tide from the sea.

The first that sailed, her name was Joy ;
She spread a smooth, white, shining
sail,
And eastward drove, with bending spars,
Before the sighing gale.

Another sailed, her name was Hope ;
No cargo in her hold she bore ;
Thinking to find in western lands
Of merchandise a store.

The next that sailed, her name was Love ;
She showed a red flag at her mast,
A flag as red as blood she showed,
And she sped south right fast.

The last that sailed, her name was Faith ;
Slowly she took her passage forth,
Tacked, and lay to ; at last she steered
A straight course for the north.

My gallant ships, they sailed away
Over the shimmering summer sea ;
I stood at watch for many a day,
But one came back to me.

For Joy was caught by pirate Pain ;
Hope ran upon a hidden reef ;
And Love took fire, and foundered fast
In whelming seas of grief.

Faith came at last, storm-beat and torn ;
She recompensed me all my loss,
For, as a cargo safe, she brought
A crown linked to a cross.

SHE WAS A PHANTOM OF DELIGHT

No poet has ever described womanhood more appreciatively than Wordsworth. He himself has told us how this progressive picture of womankind from youth to middle age was composed. The first stanza is a description of a Highland girl, whose sprite-like beauty suddenly enchanted him and his sister Dorothy when they were visiting Scotland. To this were added two verses describing the revelation of full womanhood in his wife, expanding into homely helpfulness, and yet retaining its early charm

SHE was a phantom of delight
When first she gleamed upon my sight,
A lovely apparition, sent
To be a moment's ornament ;
Her eyes as stars of twilight fair ;
Like twilight's, too, her dusky hair ,
But all things else about her drawn
From May-time and the cheerful dawn ;
A dancing shape, an image gay,
To haunt, to startle, and waylay.

I saw her upon nearer view,
A spirit, yet a woman too !
Her household motions light and free,
And steps of virgin liberty ;
A countenance in which did meet
Sweet records, promises as sweet ;
A creature not too bright or good
For human nature's daily food ;
For transient sorrows, simple wiles,
Praise, blame, love, kisses, tears, and
smiles.

And now I see with eye serene
The very pulse of the machine ;
A being breathing thoughtful breath,
A traveller between life and death ;
The reason firm, the temperate will,
Endurance, foresight, strength, and skill ;
A perfect woman, nobly planned,
To warn, to comfort, and command ;
And yet a spirit still, and bright
With something of angelic light.

ODE TO THE NORTH-EAST WIND

Charles Kingsley was a breezy lover of outdoor life as well as a poet, a novelist, and a parson labelled "dangerous" by bishops when he was young. This hymn to the north-east wind, which most people hate and fear, is characteristic of him. He was just the man to go out and rollick in a wind that daunts many men. Never did anyone write of boisterous winds with more gusto than he shows in this poem. But he forgot that such winds are dangerous for men of lengthening years, and at last the wind he sang of slew him. He was then—it was in January 1875—in his sixty-sixth year.

WELCOME, wild North-easter !
 Shame it is to see
 Odes to every zephyr ;
 Ne'er a verse to thee.
 Welcome, black North-easter !
 O'er the German foam ;
 O'er the Danish moorlands,
 From thy frozen home.
 Tired we are of summer,
 Tired of gaudy glare,
 Showers soft and steaming,
 Hot and breathless air.
 Tired of listless dreaming
 Through the lazy day :
 Jovial wind of winter,
 Turn us out to play !
 Sweep the golden reed-beds ;
 Crisp the lazy dyke ;
 Hunger into madness
 Every plunging pike.
 Fill the lake with wild-fowl ;
 Fill the marsh with snipe ;
 While on dreary moorlands
 Lonely curlew pipe.
 Through the black fir-forest
 Thunder harsh and dry,
 Shattering down the snow-flakes
 Off the curdled sky.
 Hark ! The brave North-easter !
 Breast-high lies the scent,
 On by holt and headland,
 Over heath and bent.
 Chime, ye dappled darlings,
 Through the sleet and snow.
 Who can over-ride you ?
 Let the horses go !
 Chime, ye dappled darlings,
 Down the roaring blast ;
 You shall see a fox die
 Ere an hour be past.
 Go ! and rest tomorrow,
 Hunting in your dreams,
 While our skates are ringing
 O'er the frozen streams.
 Let the luscious South wind
 Breathe in lovers' sighs.
 While the lazy gallants
 Bask in ladies' eyes.
 What does he but soften
 Heart alike and pen ?

'Tis the hard grey weather
 Breeds hard English men.
 What's the soft South-wester ?
 'Tis the ladies' breeze,
 Bringing home their true-loves
 Out of all the seas :
 But the black North-easter,
 Through the snowstorm hurled,
 Drives our English hearts of oak
 Seaward round the world.
 Come, as came our fathers,
 Heralded by thee,
 Conquering from the eastward,
 Lords by land and sea.
 Come ; and strong within us
 Stir the Vikings' blood ;
 Bracing brain and sinew ;
 Blow, thou wind of God !

A THING OF BEAUTY

These are the opening lines of *Endymion*, the first long poem written by John Keats. They strike at once the keynote of the poet's soul—the love of beauty. Most of the things of beauty that move the poet's heart so deeply, it will be seen, are very simple. We can all enjoy them if we have the eyes to see and hearts to feel their loveliness.

A THING of beauty is a joy for ever :
 Its loveliness increases ; it will never
 Pass into nothingness ; but still will keep
 A bower quiet for us, and a sleep
 Full of sweet dreams, and health, and
 quiet breathing.
 Therefore, on every morrow, are we
 wreathing
 A flowery band to bind us to the earth,
 Spite of despondence, of the inhuman
 dearth
 Of noble natures, of the gloomy days,
 Of all the unhealthy and o'er-darkened
 ways
 Made for our searching : yes, in spite of all,
 Some shape of beauty moves away the pall
 From our dark spirits. Such the sun, the
 moon,
 Trees old and young, sprouting a shady
 boon
 For simple sheep ; and such are daffodils
 With the green world they live in ; and
 clear rills
 That for themselves a cooling covert make
 'Gainst the hot season ; the mid-forest
 brake,
 Rich with a sprinkling of fair musk-rose
 blooms :
 And such, too, is the grandeur of the
 dooms
 We have imagined for the mighty dead ;
 All lovely tales that we have heard or read :
 An endless fountain of immortal drink,
 Pouring unto us from the heaven's brink.

TO TUSITALA IN VAILIMA

Tusitala, Teller of Stories, was the name given by the islanders of Samoa to Robert Louis Stevenson when he spent the last four years and eight months of his life among them. Only three days before his death in that beautiful far-away island home of his there came to him from his dear friend in England, Edmund Gosse, this poem, reminding him how, 24 years earlier, they had sailed together the seas that wash the rugged Western Islands of the land where he longed to be. For R. L. S., tale-teller, poet, and essayist, was Scottish to the core, though the search for health took him into exile in the loneliness of the mild-aired Pacific. Into this poem, so loyal and tender, are gathered echoes of the romance and heroism and tragedy of one of the rarest men of genius in the annals of our literature.

CLEAREST voice in Britain's chorus,
Tusitala !

Years ago, years four-and-twenty,
Gray the cloudland drifted o'er us,
When these ears first heard you talking,
When these eyes first saw you smiling.
Years of famine, years of plenty,
Years of beckoning and beguiling,
Years of yielding, shifting, baulking,
When the good ship *Clansman* bore us
Round the spits of Tobermory,
Glens of Voulin like a vision,
Craggs of Knoidart, huge and hoary,
We had laughed in light derision
Had they told us, told the daring,

Tusitala,

What the years' pale hands were bearing,
Years in stately, dim division.

Now the skies are pure above you,
Tusitala ;

Feathered trees bow down to love you ;
Perfumed winds from shining waters
Stir the sanguine-leaved hibiscus
That your kingdom's dusk-eyed daughters
Weave about their shining tresses ;
Dew-fed guavas drop their viscous
Honey at the sun's caresses
Where eternal summer blesses
Your ethereal musky highlands,
Ah ! but does your heart remember,

Tusitala,

Westward in our Scotch September,
Blue against the pale sun's ember,
That low rim of faint long islands,
Barren granite-snouted nesses,
Plunging in the dulled Atlantic,
Where beyond Three one guesses
At the full tide, loud and frantic ?

By strange pathways God hath brought
you,

Tusitala,

In strange webs of fortune caught you,
Led you by strange moods and measures
To this paradise of pleasures !

And the bodyguard that sought you
To conduct you home to glory,
Dark the oriflammes they carried,
In the mist their cohort tarried,
They were Languor, Pain, and Sorrow,
Tusitala !

Scarcely we endured their story
Trailing on from morn to morrow,
Such the devious road they led you,
Such the error, such the vastness,
Such the cloud that overspread you,
Under exile bowed and banished,
Lost, like Moses in the fastness,
Till we almost deemed you vanished.

Vanished, ay, that's still the trouble,
Tusitala !

Though your tropic isle rejoices,
'Tis to us an isle of Voices
Hollow like the elfin double
Cry of disembodied echoes,
Or an owlet's wicked laughter,
Or the cold and hornèd gecko's
Croaking from a ruined rafter,
Voices these of things existing,
Yet incessantly resisting,
Eyes and hands that follow after ;
You are circled, as by magic,
In a surf-built palmy bubble,
Tusitala ;

Fate hath chosen, but the choice is
Half delectable, half tragic,
For we hear you speak, like Moses,
And we greet you back, enchanted,
But reply's no sooner granted
Than the rifted cloud-land closes.

TO CELIA

This charming example of dainty, complimentary verse is from the pen of Ben Jonson, a good scholar, and friend of Shakespeare. The lines are a transcript from a Greek writer who died in the third century.

DRINK to me only with thine eyes,
And I will pledge with mine ;
Or leave a kiss but in the cup
And I'll not look for wine.
The thirst that from the soul doth rise
Doth ask a drink divine ;
But might I of Jove's nectar sup,
I would not change for thine.

I sent thee late a rosy wreath,
Not so much honouring thee
As giving it a hope that there
It could not withered be ;
But thou thereon didst only breathe,
And sent'st it back to me ;
Since when it grows, and smells, I swear,
Not of itself but thee !

LITTLE VERSES FOR VERY LITTLE PEOPLE

HE was a rat, and she was a rat,
And down in one hole they did dwell
And both were as black as a witch's cat,
And they loved one another well.

He had a tail, and she had a tail,
Both long and slender and fine ;
And each said : " Yours is the finest tail
In the world, excepting mine."

He smelt the cheese, and she smelt the cheese,
And they both pronounced it good ;
And both remarked it would greatly add
To the charms of their daily food.

So he ventured out, and she ventured out,
And I saw them go with pain ;
And now what befell them I never can tell,
For they never came back again.



MY father he left me three acres of land,
Sing ivy, sing ivy ;
My father he left me three acres of land,
Sing holly, go whistle, and ivy !

I ploughed it with a ram's horn,
Sing ivy, sing ivy ;
And sowed it all over with one peppercorn,
Sing holly, go whistle, and ivy !

I harrowed it with a bramble bush,
Sing ivy, sing ivy ;
And reaped it with my little penknife,
Sing holly, go whistle, and ivy !

□ □

GREAT A, little a, bouncing B,
The cat's in the cupboard and she
can't see.

MONDAY's child is fair of face,
Tuesday's child is full of grace,
Wednesday's child is full of woe,
Thursday's child has far to go,
Friday's child is loving and giving,
Saturday's child works hard for its living,
And a child that's born on the Sabbath day
Is fair and wise and good and gay.

□ □

RING the bells—ring !
Hip, hurrah for the King !
The dunce fell into the pool, oh !
The dunce was going to school, oh !
The groom and the cook
Fished him out with a hook,
And he piped his eye like a fool, oh !



LITTLE VERSES FOR VERY LITTLE PEOPLE

CLAP hands, clap hands,
Hie Tom Randy,
Did you see my good man?
They call him Cock-a-bandy.

Silken stockings on his legs,
Silver buckles glancing,
A sky-blue bonnet on his head,
And, oh, but he is handsome.

A SWARM of bees in May
Is worth a load of hay;
A swarm of bees in June
Is worth a silver spoon;
A swarm of bees in July
Is not worth a fly.

JENNY WREN fell sick
Upon a merry time;
In came Robin Redbreast,
And brought her sops and wine.

"Eat well of the sop, Jenny,
Drink well of the wine."
"Thank you, Robin, kindly,
You shall be mine."

Jenny she got well,
And stood upon her feet,
And told Robin plainly
She loved him not a bit.

Robin, being angry,
Hopped upon a twig,
Saying, "Out upon you, Jenny!
Fi upon you, bold-faced jig!"

WHEN the wind is in the East
'Tis neither good for man nor beast;
When the wind is in the North
The skilful fisher goes not forth;
When the wind is in the South
It blows the bait in the fishes' mouth;
When the wind is in the West
Then 'tis at the very best.

SIX little mice sat down to spin;
Pussy passed by, and she peeped in.
"What are you at, my little men?"
"Making coats for gentlemen."
"Shall I come in and bite off your
threads?"
"No, no, Miss Pussy, you'll bite off our
heads."
"Oh, no, I'll not; I'll help you to spin."
"That may be so, but you don't come
in!"

HERE sits the Lord Mayor, here sits his
two men,
Here sits the cock, and here sits the hen;
Here sits the chickens, and here they go
in,
Chippety, chippety, chippety, chin.

WHEN Jacky's a very good boy
He shall have cakes and a custard;
But when he does nothing but cry
He shall have nothing but mustard.

MARGERY MUTTON-PIE and Johnny Bo-
peep,
They met together in Gracechurch Street,
In and out and over the way;
"Oh," says Johnny, "it's chops today."

COBBLER, cobbler, mend my shoe,
Give it a stitch and that will do;
Here a nail and there a prod,
And now my shoe is very well shod.

HIGH diddle ding,
Did you hear the bells ring?
The Parliament soldiers are gone to the
King!
Some they did laugh, some they did cry,
To see the Parliament soldiers pass by.

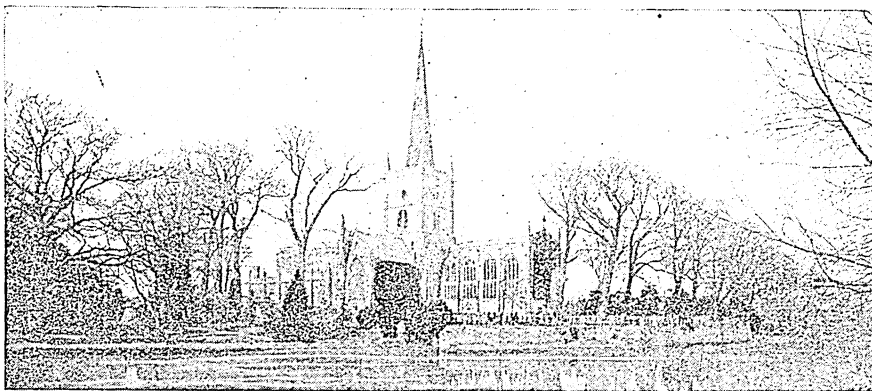
BLOW, wind, blow! and go, mill, go!
That the miller may grind his corn;
That the baker may take it, and into rolls
make it,
And send us some hot in the morn.

HANNAH BANTRY, in the pantry,
Eating a mutton bone;
How she gnawed it, how she clawed it,
When she was alone!

THERE was a little man, and he had a
little gun,
And his bullets were made of lead, lead,
lead;
He shot Johnny King through the
middle of his wig,
And knocked it right off his head, head,
head.

HUMPTY DUMPTY sat on a wall,
Humpty Dumpty had a great fall;
All the king's horses and all the king's men
Couldn't put Humpty Dumpty together
again.

Imperishable Thoughts of Men Enshrined in the Books of the World



Holy Trinity Church, Stratford-on-Avon, where Shakespeare was buried

SHAKESPEARE'S SONNETS

SHAKESPEARE's sonnets have been made one of the most tantalising problems of literary history. A small library of writings encircles them.

To whom did Shakespeare address these sonnets? When were they written? Do they express real feeling and reveal something of the poet's history, or are they conventional writings, following a fashion of the poet's day? Had the poet any hand in their publication? These are a few of the questions asked, and they have had widely varying answers.

Every critic who has advanced a theory on these subjects has been at pains to find reasons for distrusting other theories, and the result is that difficulties have accumulated, and no plain single authoritative answer can be given to these questions. Yet, the main drift of the sonnets is clear. Sonnet writing was a courtly fashion in Shakespeare's day. It was derived from Italian literature, but the sonnet form was often varied from the Italian models. The feeling expressed in the fashionable sonnet was generally personal, complimentary, and by custom exaggerated. Especially was this so where poets were addressing influential patrons of literature.

Shakespeare came from Stratford-on-Avon into the theatrical, literary, and

sonneteering world on the outskirts of courtly society, and he began to write imitatively, but gradually developed a style of his own. It was natural that he should write sonnets. They were popular. They attracted the attention of all who had literary inspirations. Besides, they could be used to compliment the kind of people who were able to give protection to the companies of players who were Shakespeare's professional comrades. So, in the years when he was a rising man (between his twenty-fifth and thirty-fifth years) he wrote a series of 154 sonnets that were not published in book form, but circulated among his friends, and in sonnet-writing society. Two of the latest of these sonnets were printed in 1599, but before that the poet had won a private reputation as a sonneteer.

It was not till 1609, when Shakespeare was famous and prosperous, that a bookseller collected the poems and published them, apparently without leave. Half a dozen editions were sold before the poet's death in 1616. As there was no copyright law then the only advantage that came to the poet was increasing fame. The gain in money belonged to the pirate publisher, who seemed to admire the man who collected the sonnets more than he admired the man who wrote them.

ROMANCE • HISTORIES • DRAMAS • ESSAYS • WORLD CLASSICS

The sonnets consist of two groups. One, numbering 126, is addressed to some young unknown man, who was probably a patron of the poet, and certainly a friend. The remaining 28 are either addressed to, or are concerned with, a woman who had treated the poet badly. Frankly, we do not know who these people were, and probably the world will never know.

The sonnets to the man have certain conventional features common to similar writings of the period, but strange to us. They abound in outspoken flattery. They claim that they will endow the man who is their subject with lasting fame. This was not unnatural at a time when the poetry of long ago was being read and was preserving, in some degree, the personalities of people whom poets had praised in past centuries. The writings of poets was proving itself a lasting memorial of men and women who otherwise would not have been heard of.

In a variety of ways Shakespeare commemorated his friend. He mourned his absence. He showed jealousy of his admiration of another poet, and of a woman whom both of them, poet and patron, knew. Whether these sentiments were quite as real as they seem may be doubted. They served as material for the sonnets, and some genuine feeling was

probably involved, though the sonnet was usually an artificial literary product. The friend remains in the sonnets a vague wraith, thinly existent because Shakespeare knew him, but we do not know his name. He does not correspond quite satisfactorily to anyone of that age whom we know of from other sources than these sonnets. The poet's writing lives, but the man he commemorated does not live, except as the provoker of a long series of sonnets, some of no considerable merit, and some saturated with a beauty that will preserve them as long as the English language lasts.

That is the distinction of Shakespeare's sonnets. Using an artificial form of verse and using it in accordance with a fashion that belonged to his day, and now has lost a good deal of its propriety—for Shakespeare was a man of supremely great intellect flattering one who now is a nameless nobody—the poet, by his attendant and often casual thought, expressed in words of matchless music, has made some of these sonnets an everlasting possession of English-speaking peoples.

Here we illustrate the sonnets by a selection of eleven of them, with a few comments on each. We give the numbering of each sonnet in the list, but the sequence of the sonnets is sometimes open to doubt.

A SELECTION FROM THE SONNETS

30

The first two lines of this sonnet on memory in its sadder forms have left their echo in all thoughtful minds. The tribute to friendship at the close is an example of exaggeration that may be forgiven.

WHEN to the sessions of sweet silent thought
I summon up remembrance of things past,
I sigh the lack of many a thing I sought,
And with old woes new wail my dear time's waste;
Then can I drown an eye, unused to flow,
For precious friends hid in death's dateless night,
And weep afresh love's long-since-cancelled woe,
And moan the expense of many a vanished sight.
Then can I grieve at grievances foregone,
And heavily from woe to woe tell o'er
The sad account of fore-bemoaned moan,
Which I new pay as if not paid before:
But if the while I think on thee, dear Friend,
All losses are restored, and sorrows end.

33

Here the poet laments a temporary apparent obscuring of his friendship, using for the purpose a most lovely description of a bright dawn and changeful day. The first four lines reveal the sense of beauty which separated Shakespeare from all the sonnet-writers of his age.

FULL many a glorious morning have I
seen
Flatter the mountain tops with sovereign eye,
Kissing with golden face the meadows green,
Gilding pale streams with heavenly alchymy;
Anon permit the basest clouds to ride
With ugly rack on his celestial face,
And from the forlorn world his visage hide,
Stealing unseen to west with this disgrace:
Even so my sun one early morn did shine
With all-triumphant splendour on my brow;
But out, alack! he was but one hour mine,
The region cloud hath masked him from me now.

SHAKESPEARE'S SONNETS

Yet him for this my love no whit
disdaineth;
Suns of the world may stain when
heaven's sun staineth.

57

Here Shakespeare expresses the absolute trust of love
He will wait patiently upon his friend, and think no ill.

BEING your slave, what should I do but
tend

Upon the hours and times of your desire?
I have no precious time at all to spend,
Nor services to do, till you require;
Nor dare I chide the world-without-end
hour

Whilst I, my sovereign, watch the clock
for you,

Nor think the bitterness of absence sour
When you have bid your servant once
adieu;

Nor dare I question with my jealous thought
Where you may be, or your affairs suppose,
But, like a sad slave, stay and think of
nought,

Save, where you are how happy you make
those.

So true a fool is love that in your will,
Though you do anything, he thinks no ill.

60

Shakespeare is never greater than when he pictures
things vast and profound, like the slow, invincible power
of Time; and here he does it with most exquisite grace, his
lines singing themselves in our ears.

LIKE as the waves make towards the
pebbled shore,

So do our minutes hasten to their end;
Each changing place with that which goes
before,

In sequent toil all forwards do contend.
Nativity, once in the main of light,
Crawls to maturity, wherewith being
crowned,

Crooked eclipses 'gainst his glory fight,
And Time that gave doth now his gift
confound.

Time doth transfix the flourish set on
youth

And delves the parallels in beauty's brow;
Feeds on the rarities of Nature's truth,
And nothing stands but for his scythe to
mow:

And yet to times in hope my verse shall
stand,

Praising thy worth, despite his cruel hand.

64

Another solemn survey of the power of Time. The
second quatrain, lines 5 to 8, describes once for all the
changeable conflict of land and sea, one gaining here and
losing there. With what a noble dignity it is all portrayed!

WHEN I have seen by Time's fell hand
defaced

The rich-proud cost of outworn buried age;

When sometime lofty towers I see down-
razed

And brass eternal slave to mortal rage;
When I have seen the hungry ocean gain
Advantage on the kingdom of the shore,
And the firm soil win of the watery main,
Increasing store with loss, and loss with
store;

When I have seen such interchange of state,
Or state itself confounded to decay;

Ruin hath taught me thus to ruminate—
That Time will come and take my love away.

This thought is as a death, which cannot
choose

But weep to have that which it fears to
lose.

65

This sonnet is in sequence to the last, but with an added
tenderness, the fragility of beauty in the midst of Nature's
stern forces being exquisitely suggested. The idea that
words well framed may keep alive the memory of things
past comes like a refrain into Shakespeare's sonnets.

SINCE brass, nor stone, nor earth, nor
boundless sea,

But sad mortality o'ersways their power,
How with this rage shall beauty hold a plea,
Whose action is no stronger than a
flower?

O how shall summer's honey breath hold
out

Against the wreckful siege of battering
days,

When rocks impregnable are not so stout
Nor gates of steel so strong, but Time
decays?

O fearful meditation! where, alack!
Shall Time's best jewel from Time's chest
lie hid?

Or what strong hand can hold his swift foot
back,

Or who his spoil of beauty can forbid?

O! none, unless this miracle have might,
That in black ink my love may still
shine bright.

71

The opening thought of this sonnet (I love you so much
that I would not have you mourn for me when I am dead)
has a deep tenderness in it; but the fear of what others
may say is trivial, for how can others alter a true friendship?

NO longer mourn for me when I am dead
Than you shall hear the surly sullen
bell

Give warning to the world, that I am fled
From this vile world, with vilest worms to
dwell;

Nay, if you read this line, remember not
The hand that writ it; for I love you so,
That I in your sweet thoughts would be
forgot

If thinking on me then should make you
woe.

O if, I say, you look upon this verse,
 When I perhaps compounded am with
 clay,
 Do not so much as my poor name rehearse,
 But let your love even with my life decay ;
 Lest the wise world should look into
 your moan,
 And mock you with me after I am gone.

73

This powerful sonnet, with the exquisite opening picturing the wind-swept trees of late autumn, suggests that Shakespeare felt age creeping on him. But it must have been one of the illusions of departing youth, for probably he was not more than thirty-five years old when this was written. He however aged early, as we can see by the changing tone of his mind in his later writings, and he died when he was fifty-two.

THAT time of year thou mayst in me
 behold
 When yellow leaves, or none, or few, do
 hang
 Upon those boughs which shake against
 the cold,
 Bare ruined choirs, where late the sweet
 birds sang.
 In me thou see'st the twilight of such day
 As after sunset fadeth in the west ;
 Which by and by black night doth take
 away,
 Death's second self, that seals up all in
 rest.
 In me thou see'st the glowing of such fire,
 That on the ashes of his youth doth lie,
 As the death-bed whereon it must expire
 Consumed with that which it was
 nourished by.
 This thou perceiv'st, which makes thy
 love more strong,
 To love that well which thou must leave
 ere long.

98

Shakespeare was always a countryman at heart. No poet has burst into springlike song more naturally than he. See how his delight in country colours, sounds, and odours runs blithely through this sonnet, till the personal application at the end, though pretty, seems a little unreal.

FROM you I have been absent in the
 spring,
 When proud-pied April dressed in all his
 trim,
 Hath put a spirit of youth in every thing,
 That heavy Saturn laughed and leaped
 with him.
 Yet nor the lays of birds, nor the sweet
 smell
 Of different flowers in odour and in hue,
 Could make me any summer's story tell,
 Or from their proud lap pluck them where
 they grew ;
 Nor did I wonder at the lily's white,

Nor praise the deep vermilion in the rose ;
 They were but sweet, but figures of
 delight,
 Drawn after you, you pattern of all those.
 Yet seemed it winter still, and, you away,
 As with your shadow I with these did
 play.

106

The idea in this sonnet—that all the beauty in writings of the past is but a preface to existing living beauty, which still it cannot wholly describe—may be regarded as what men of Shakespeare's day called "a conceit," which meant a rather fantastic comparison. Really, however, it is true. We have all past thought and expression to help us and yet cannot quite adequately describe the loveliness of either Nature or humanity at its best.

WHEN in the chronicle of wasted time
 I see descriptions of the fairest
 wights,
 And beauty making beautiful old rhyme
 In praise of ladies dead and lovely knights,
 Then, in the blazon of sweet beauty's best,
 Of hand, of foot, of lip, of eye, of brow,
 I see their antique pen would have
 expressed
 Even such a beauty as you master now.
 So all their praises are but prophecies
 Of this our time, all you prefiguring ;
 And, for they looked but with divining eyes,
 They had not skill enough your worth to
 sing :
 For we, which now behold these present
 days,
 Have eyes to wonder, but lack tongues
 to praise.

116

This sonnet is the culmination and crown of all Shakespeare's sonnets. It demands and asserts the perpetuity of true love, and raises it to the sublimity of eternity. None of the poet's writings show better than these lines the soundness of his heart and his faith.

LET me not to the marriage of true minds
 Admit impediments. Love is not love
 Which alters when it alteration finds,
 Or bends with the remover to remove :
 O, no ! it is an ever-fixèd mark,
 That looks on tempests and is never
 shaken ;
 It is the star to every wandering bark,
 Whose worth's unknown, although his
 height be taken.
 Love's not Time's fool, though rosy lips
 and cheeks
 Within his bending sickle's compass come ;
 Love alters not with his brief hours and
 weeks,
 But bears it out even to the edge of doom.
 If this be error, and upon me proved,
 I never writ, nor no man ever loved.

The Story of the Most Beautiful Book in the World



PAUL SAVES CHRISTIANITY

IT is almost certain that to the labours of Paul at Antioch we owe the name of *Christians*. Hitherto the followers of Jesus were called Nazarenes or Galileans—both meant as terms of contempt, as Nazareth was a wretched city, and Galilee a provincial district of no reputation whatever. These names were used by the Jews to show their contempt for the ignorant men who worshipped an obscure carpenter from that despised part of their little world. They hoped people would be ashamed to join a sect at which all Jews of education curled the lip with disdain.

To the Nazarenes themselves the little flock was known as the Brotherhood, the Disciples, the Believers, the Faithful. Probably, as Peter enjoyed a position of unique authority, his term was the one most generally used. Peter, curiously enough, never once uses the word Christ, but calls the followers of Christ by a beautiful term used by no other apostle—the Brotherhood. He also speaks of the community as a holy nation, a people, a house, a flock, a priesthood. But the emphatic command of this chief among the apostles was: *Love the Brotherhood*.

But what better title could be found than *Christian*? Yet this word, which is now common to every nation and language,

associated with the art and literature, the philanthropy and conduct, the mercy and the humanity of all European civilisation, was first bestowed on the followers of Jesus in derision.

How did it arise? The answer reveals to us the character of Paul, and lights up for us the darkness which lies upon his work at Antioch. Before the coming of Paul the followers of Jesus at Antioch had been derisively treated as an obscure sect of the Jewish religion, mere followers of Jehovah with some new ideas, mostly fantastic, about that tribal deity.

They were not known at Antioch by any name at all, nor did anybody trouble about them any more than people would bother to ask the name of a new sect among the Chinese in Limehouse or the Italians in Soho. If they had any name at all, it was Nazarenes.

But with the coming of Paul the great city of Antioch woke to the knowledge that this new religion was something more than a Jewish sect. The wits of the marketplace, the fashionable loungers in the streets, noblemen in their marble palaces and groves of myrtle, discussed the new philosopher with interest and amusement. Paul provided something new, a diversion for these tired citizens of the Roman

GREAT FIGURES OF THE OLD TESTAMENT · THE LIFE OF JESUS

Empire ; they were very grateful to have a fresh topic of conversation.

If they had only known that when their palaces were in dust, and their names wiped off the tablets of memory, when their lives were of no more interest to humanity than the lives of last year's flies—if they had only known then that, for endless centuries, the name of the man at whom they laughed would be known throughout the world, and his genius acknowledged by all nations, how those laughing citizens of Antioch would have started and wondered !

HOW THE FIRST FOLLOWERS OF JESUS WERE CALLED CHRISTIANS

As it was, they recognised Paul sufficiently to talk about him ; and very soon the wits of Antioch had a nickname for his converts : they called them Christians. It probably began by being *Chrestiani*, founded on the Greek word *Chrestos*, which means excellent and would easily be confounded with *Christus*, the name by which Jesus was preached to the Greeks and Romans. The wits of Antioch gathered in their light way that Paul was preaching about someone who was utter perfection, utter excellence, some new god or other, whose name was *Chrestos*. "Let us call these mad people *Chrestiani*," they would say, meaning that they were mortals trying to be gods. Later the true name came home to them, and they spoke not of *Chrestiani*, but *Christiani*, or, as we should say, *Christians*.

HOW CHRISTIANITY SWEEPED ACROSS THE WORLD FROM ANTIOCH

From this historic fact we may gather knowledge which is most interesting and most instructive. First of all we see that Paul roused Antioch. Remember that it was a mighty city, and filled with people of all nationalities. Paul, by his earnest preaching, roused this city to see that the Nazarenes were not a sect of the Jewish Church, not a mere heresy of Jehovah worshippers, but a new religion. This is interesting and important. It shows us the vigour and force of Paul. It gives him his rightful place in history, which is immediately below his Master. Before Paul reached Antioch Christianity was not a great force ; before he left it had started to sweep across the known world.

But we gather from this nickname bestowed upon the Nazarenes by the wits of Antioch that Paul revealed the new

religion as the worship of a Person. He set up no church, he accepted no overlordship of men, he formulated no system of philosophy. No ! He had one message, one awakening message for the souls of Antioch, and that was the *character* of Christ. It was a person, not a code of laws, that he presented before the gaze of men.

He did not say : "You must think this, you must obey that, you must not do what those others do." He said : "Worship Christ, worship the Son of God, who has told us that God is Love, and that love is the law of life, and who has brought immortality to light."

Paul showed them no conquering emperor, no miracle-worker, no great and impressive scholar ; he turned their gaze to the Cross, and showed them Love hanging there with bowed head and stricken side, Jesus dying in anguish to prove the truth of what He had persistently preached—that God is Love.

THE TEACHING OF PAUL THAT WAS TO SAVE CHRISTIANITY

This we may know for certain, not only because it is the soul of all Paul's teaching, but because by that name of *Christian*, first uttered in the streets of Antioch, we perceive that he roused paganism with the name of Christ. It is a fact which we must fasten to our memory. Paul, at the threshold of his great career—a career which was to bring him into conflict with Peter himself, but a career which was to rescue Christianity from the Mosaic law and make it the Catholic ideal of the human race—fixed the gaze of the world upon Calvary.

If he had not insisted on Jesus, if he had not made the name ring in the ears of men, the brotherhood at Antioch might well have been called after his own name. But because he brushed all philosophy and learning on one side, and exhibited, in place of tablets of stone, the picture of Christ crucified for the sins of the world, because he exhibited to the gaze of humanity this *character*, this *man*, and this act of love—because of this the followers of the Galileans came to be called Christians.

Only eleven years had passed since the Carpenter of Galilee died in Jerusalem, deserted by all his followers, died an ignominious death with the cry of anguish and despair on his lips : "My God, My God, why hast Thou forsaken Me ?"

PAUL SAVES CHRISTIANITY

Think quietly and resolutely what this means. In the first place, see how true is the narrative of Christ's life, which makes him die with apparent defeat. There is no cry in all the written history of humanity so terrible, so desolate, so haunting as that cry of the dying Christ.

Why did the writers of the Gospels record it? Why did they not blot it out? If they wished to make Jesus of Nazareth the Christ of heaven, the Son of God, why did they not tear it from their record, and leave there nothing but the wonderful story of his miracles and success?

They wrote down this cry of agony, and they wrote down other facts of Christ's life which *seem* to contradict his claim to be the Christ, because the impression made by Jesus was so tremendous that they *dared* not lie concerning him.

And now, only eleven years after that awful cry went up to heaven, the character of Christ, quite independently of churches and rituals, had passed from Jerusalem and was influencing the nations.

We are stating historical facts; and these historical facts witness to the truth of Christ's claim. Eleven years after the Carpenter of Nazareth died a criminal death in a Jewish city, Greeks, Romans, and Syrians, in a city so splendid and cosmopolitan as Antioch, were striving to make their characters like his, were praying in his name to a God of Love, were ordering their lives not by strength, self-assertion, and pride, but by sweetness, gentleness, charity, and humility.

Behold, I show you a mystery!

We pause to impress this fact upon our minds because it must be the basis of our historical faith in Christ. We may

meet many people who will try to persuade us that Christianity is not true; we may read many books which will criticise this Gospel and that, and strive to show errors in dates and translations and other minor things; but there is no man and no book that can explain to us how the *character* of a Jew in a Roman province, who died a shameful death with a cry of defeat on his lips, came to be the ideal of the civilised Greeks, Romans, and Syrians, in one of the three greatest cities of the world, only eleven years after his crucifixion.

In making ourselves acquainted with the romantic life of Paul we are not only

following the adventures of one of the greatest men who ever lived, we are not only following the story of Christianity's conquest of the world, but we are possessing ourselves of the foundation of our faith in the historic Christ.

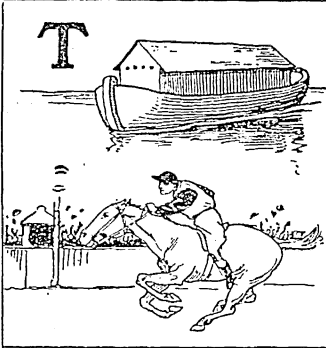
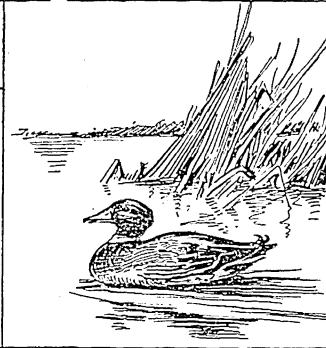


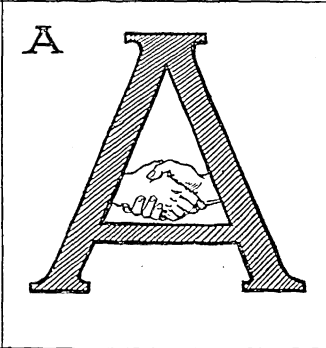


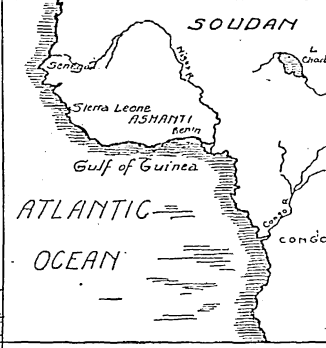
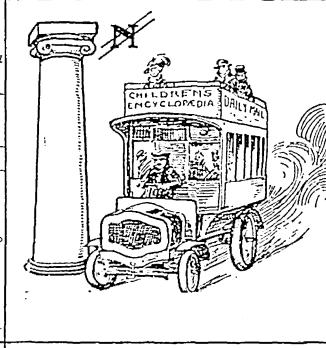
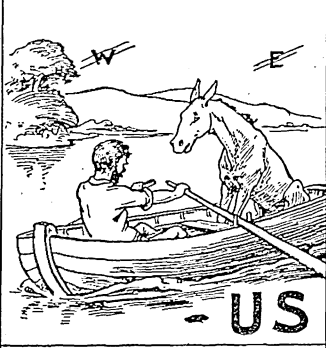
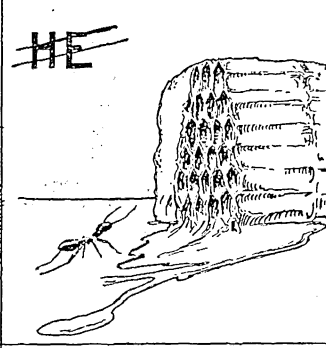

The greatest argument as to the truth of Christ's claim is one that cannot be written, for it is inexpressible. It is happiness love and peace that come to every heart in which he is worshipped and his example followed.

But next to this sublime argument is the historic argument of Paul himself. Paul is not only the apostle to the foreigners, he is the unanswerable argument of the truth and reality of Christ. His year's work at Antioch could not have had such extraordinary effect unless behind it had been the conviction that Christ had appeared to him, had spoken to him, and had sent him out to be the apostle to the world outside Jewish narrowness. Paul believed in his conversion. No man can persuade us that this burning Pharisee was deluded by a conversion which completely revolutionised his character.



PAUL PREACHING

PUZZLE PICTURE-NAMES OF FAMOUS MEN

		
1 A King of Early Rome	2 A Great English Admiral	3 A Real Robinson Crusoe
		
4 An African Explorer	5 The Mother of an Emperor	6 A King of Portugal
		
7 A Great Discoverer	8 An Australian Explorer	9 A Discoverer of a Country
		
10 The Founder of a City	11 A Man who Lost an Empire	12 An Immortal Poet

THE PICTURES ON THIS PAGE REPRESENT FAMOUS MEN WHO COME INTO THE INDEX OF THE CHILDREN'S ENCYCLOPEDIA. THEIR NAMES APPEAR IN SECTION 53 OF GROUP 18

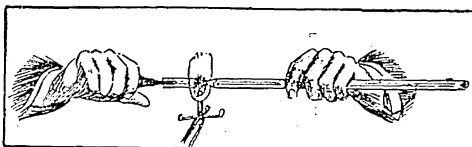
The Interests and Pleasures of Life for All Indoors and Out



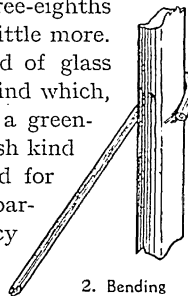
A BAROMETER A BOY CAN MAKE

THE manufacture of the barometers that we see hanging in the halls of houses and in the windows of the shops where they are sold is beyond the abilities of the school-boy. But by following the instructions on this page any boy can make a barometer that will illustrate the principle and serve the purpose equally well.

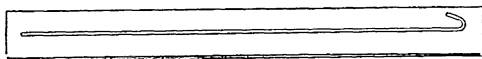
The first thing we need is a piece of glass tubing. It should be forty-two inches long and its inside diameter a quarter of an inch, so that outside it should be three-eighths of an inch in diameter, or a little more. There is more than one kind of glass tubing, and we must get the kind which, when looked at sideways, has a greenish appearance. This greenish kind is the best for the purpose, and for this reason. The pure, transparent glass owes its transparency to a substance called oxide of lead. If we fill such a tube with mercury, the mercury draws out the oxide of lead from the glass and forms a substance that sticks to the inside of the tube and prevents the mercury moving up and down.



1. Closing the end of the barometer tube



2. Bending the tube



3. Position of tube on the frame

The first thing we do with the glass tube is to wash it in warm water. Pour the warm water through it until it is quite clean. If it is very dirty it may be neces-

sary to put a string through the tube, and then to tie a piece of cloth to one end of the string and pull the cloth right through the tube. To dry it, we tie a piece of string to a piece of clean, soft linen cloth, put the other end of the string through the tube, and pull the cloth right through, doing this again and again till the tube is quite dry from end to end.

Now we take the tube and put it into a gas-flame, letting the flame heat it about two inches from one end, as shown in picture 1. This end we hold with a pair of pliers, the kind that has round ends, or noses, as they are called. The end should be thin enough to go inside the tube.

When we find that the gas-flame has softened the tube at the place where it has been, we pull the two ends of the tube apart, gently turning it round a little as we do so. We find that we pull the tube into two pieces and that each end has a long tail. We can throw away the small piece of tube, but we have not yet finished with the long piece. We must get rid of the long, thin end, and at the same time leave the tube closed at the end instead of open



4. The tube ready for the mercury

as before. Therefore we again heat the end of the tube, turning it round as we do so, and, with the help of the pliers or any convenient metal instrument, tap the end until

CRAFTS • GAMES • NEEDLEWORK • PUZZLES • SCIENCE EXPERIMENTS

THINGS TO MAKE & DO

we make a neat end as nearly round as possible and without the long, thin part. This part of the work requires a little care, as we must not burn our hands or clothes, but is not at all difficult.

Having got the tube with one end closed and rounded, we must make a bend near the other end. This bend must be a gradual curve just as if the tube were bent round a wheel one and a quarter inches in diameter. In fact, we may use a piece of wood or metal of this diameter to assist us in making the bend, as seen in picture 2. We measure the tube thirty-six inches from the end that we have sealed up, and heat it in the gas-flame at this place. As it becomes a little soft, but not quite so soft as we made the other end, we bend it round a little, then heat it again and bend it again until we have made the lower or short end almost, but not quite, parallel with the long part of the glass tube.

The tube is made; we can now make the wood back on which to mount it. Get a piece of wood 40 inches long, four inches wide, and about half an inch thick. Now get another piece of wood the same size, but only a quarter of an inch thick. Plane the wood all round until it is smooth. Now lay the glass tube on the thinner piece of wood in the position shown in picture 3, and mark round it carefully with a pencil. Cut out with a chisel the wood marked, and nail the thin piece of wood to the thicker piece, taking care to keep the edges in line. We now have a board with a recess that fits the tube, and in which the tube may be fixed when we have filled it with mercury.

The next part of our work is to fill the tube with mercury, which should be as nearly pure as possible. We can easily tell if it is pure by pouring a little on a clean plate and moving the plate, so that the mercury runs about. If it breaks up into small round drops which run together readily and leave no stain on the plate, the mercury is pure and may be used. If, however, the drops into which the mercury breaks up are not round, but pear-shaped, running into each other with difficulty, or if they leave a stain on the plate, the mercury should not be used.

Even if the mercury is pure we should strain it so as to take out any solid foreign matter that may be mixed with it. Take a glass tumbler and a piece of chamois leather. Pierce the leather with small pinholes and place it over the mouth of the tumbler, pressing it down in the middle. Pour the mercury on to the leather; it will run through the pinholes, leaving any foreign matter on the leather.

Now we have to fill the tube with the mercury. The tube should be laid flat with the lower end upward, and supported in this position by something such as a book, as seen in picture 4. We can see the reason why we did not bend over the lower end to be exactly parallel with the main stem; if we had done so, it would have been more difficult to pour in the mercury.

We shall want a little filler to enable us to pour in the mercury. We can easily make this filler with a piece of paper. Take a half-sheet of note-paper that is very stiff. Fold it over into a cone-shape with a tiny hole at the top of the cone. The hole should be small enough to enable the end to go into the tube a little way. Gum the edges of the filler so that it will not come apart in use. In pouring in the mercury, prop up the short end of the tube, as seen in picture 4; with the left hand hold the filler with its nose in the tube, and pour the mercury in a thin stream into the filler. Do this till the mercury is within one inch of the open mouth of the tube. At intervals during the process agitate the tube a little, to help any air-bubbles to escape.

Place a cup on the table and lift the tube erect over it. The mercury will overflow through the lower end of the tube and the cup will catch it. Then put the end of a penholder or any other round piece of wood into the tube a little way, to make the mercury overflow more, until about one and a half inches from the top of the tube are empty.

The tube may now be placed in the wooden frame we prepared for it, and we must put over the front of the tube, in about three places, clips to keep it in place. We could have these clips of brass or tin, but we can make wooden clips more easily. They should be made the whole width of the frame. Picture 5 shows one of the clips, and picture 6 shows part of the board with a clip in position. We must be careful not to split the wood when we nail them on. The holes through which the nails are put should be made with a small bradawl.

The only thing to be done now is to mark the inches on the frame by the side of the tube. Take a piece of card, four inches long and one and a half inches wide. Cut it square and mark it like picture 7. The distance between 29 and 30 is one inch, and from 30 to 31 it is one inch. Take another card the same size and mark it as in picture 8.

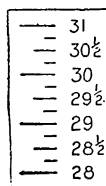
We have now to attach these cards to the frame at the side of the tube. Look at a barometer that is in good working order.



5. Wooden-clip



6. Clip in position



7. Figuring

31	VERY DRY
30½	SETTLED FAIR
30	FAIR
29½	CHANGEABLE
29	RAIN
28½	MUCH RAIN
28	STORMY

8. Wording



9. Completed barometer

A BAROMETER A BOY CAN MAKE

The dial is marked in inches. To whatever mark the dial hand points, fix the card to the frame with that mark opposite the level of the mercury near the top of the tube. Put the other card on the opposite side of the tube, as seen in picture 9, and the baro-

meter may be considered complete. But it will improve the appearance and keep dust from the tube if we put a glass front on it. This may be done by making and nailing to the edges of the top, bottom, and sides of the frame suitable pieces to hold the glass.

THE PUZZLE OF THE PIECE OF SILK

A LADY who was very fond of needlework had a round piece of red silk on which she was going to work a border, and afterwards she proposed to use it as a covering for a small antique table in her drawing-room.

She placed the circle of silk on her work-basket and was then called out of the room to see a visitor. While she was gone her little son Ronald saw the silk, and, thinking how pretty it was, he took it from the basket and spread it out on the floor.

Then, catching sight of a pair of scissors in the basket, he took them in his hand and began cutting up the silk. It was a very wrong thing to do, and Ronald should have known better.

Altogether he cut the silk into eight pieces, and, taking some pins from his mother's cushion, he pinned the pieces on the wall and stood admiring them.

At that moment his mother returned, and, of course, she was horrified to see what had

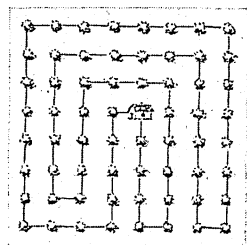
happened to her lovely circle of silk. It seemed utterly ruined, and she was very angry with Ronald, who was sent to bed early as a punishment.

His mother thought that she might put the pieces together again and join them with fancy stitching, and though the result would not be equal to the original state of the silk, still she would have a presentable crazy-work table-cover.

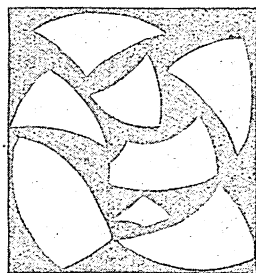
For a time it seemed impossible to make the pieces fit into a circle, but at last the lady succeeded. How did she manage it?

Take a piece of tissue or tracing paper, and put over picture 2. Trace off the eight shapes, cut them out with scissors, and try to put them together to form a circular whole. The solution is given in Section 53 of Group 18.

The solution to the puzzle of the Trees on page 6300 is shown in picture 1.



1. Solution of the Trees



2. The Pieces of Silk

SIMPLE CHEMICAL EXPERIMENTS

HERE are a few simple experiments that boys who are interested in chemistry can try for themselves. But it should be clearly understood that this part of our book is only intended for the older readers, and even they will be wise to exercise the very greatest care in anything they attempt.

We all know that acids have a sour taste, but to a chemist an acid is a substance that contains hydrogen. In the manufacture of many substances it is necessary to neutralise the acid properties, and so alkalis are used to produce this effect.

ACIDS AND ALKALIS

Vinegar is a common acid and ordinary washing soda is a familiar alkali, and there is a very simple method of testing whether a substance is an acid or an alkali.

First buy two books of litmus paper from a chemist's shop, one book of red and one of blue; then place some vinegar in an egg-cup and dissolve a little washing soda in some water in another egg-cup.

Dip a leaf of the red litmus paper into the solution of soda, and it will be seen that the red paper turns blue. Next take a leaf of the blue litmus paper and place it in the vinegar, and the blue paper turns red. If

this same piece of paper is removed from the vinegar, and placed in the soda solution, it will again become blue, and if the original piece of paper placed in the soda is transferred to the vinegar it will again become red.

This is the simplest test for finding whether a substance is acid or alkaline; acids turn blue litmus paper red, and alkalis turn red litmus paper blue.

It will be interesting to mix the two liquids, vinegar and soda solutions, to make a liquid that is neither acid nor alkaline, or, as a chemist says, a liquid that is neutral.

Pour a little of each into a third egg-cup, and test with a piece of red, and also with a piece of blue, litmus paper. If the alkali is still stronger than the acid, the red paper will turn blue and the blue paper will remain blue, and we know that more of the acid, or vinegar, is wanted. If we test again, and the liquid is then neutral, both pieces of litmus paper will tend to a purple colour.

HOW TO MAKE HYDROGEN

FOR this experiment it will be necessary to buy a test-tube, a little zinc or zinc filings, and some hydrochloric acid. Ask the chemist to dilute the hydrochloric

acid twenty times, that is, to add twenty parts of water to one of the acid. Great care must be taken not to allow the acid to touch the clothing or table-cloth, as it stains rather badly.

Place a little zinc in the test-tube and pour some of the diluted hydrochloric acid on to it, when it will be seen that bubbles rise quickly to the surface of the acid. These are bubbles of hydrogen gas, which is used for filling balloons and airships because it is so light.

This experiment is quite safe if it is not carried out close to a light, for when hydrogen mixes with air an explosive mixture is formed which a light would ignite.

HOW TO MAKE CARBON DIOXIDE

ALL gases are not lighter than air, and we are now going to make some carbon dioxide, which is a heavy gas.

Place a little chalk in a perfectly clean test-tube, and pour on to it some diluted hydrochloric acid. Bubbles will again be seen rising to the surface, but this time they are bubbles of carbon dioxide.

This is the gas which we exhale from our lungs and which makes us feel so sleepy in stuffy rooms. Being heavier than air, the carbon dioxide collects close to the ground, and this is why the air is always purer upstairs in a public hall, or theatre, than it is on the ground floor.

HOW TO MAKE CHALK

FOR this interesting experiment it will be necessary to procure a piece of glass tubing and some lime water, both of which can be obtained for a few pence from almost any chemist.

Lime water is made by dissolving slaked lime in water and allowing it to settle, and then pouring off the clear liquid into another bottle. It is important that the bottles are securely corked, however, or the lime water will become cloudy before it is wanted.

Place into the lime water one end of the glass tubing, and breathe or blow through the other end. The water will quickly become very cloudy. This is because the carbon dioxide in the breath turns the lime in the water into chalk, and chalk will not dissolve in water.

If the bottle is put aside, in a short time the chalk will settle on the bottom. In chemistry such a deposit is called a precipitate.

MAKING A RED SOLUTION CLEAR

THIS experiment shows the use of what are known in chemistry as Indicators; and with their aid it is possible to tell whether a solution is acid or alkaline, and at the same time to mystify our friends by taking the colour out of a liquid and putting it back again.

A solution of phenolphthalein should be bought from a scientific warehouse, or per-

haps a local druggist could be asked to obtain some for us.

A very little washing soda should be dissolved in a tumbler of water and a few drops of the phenolphthalein solution added until the liquid becomes a brilliant crimson. A glass stirring rod should next be dipped in hydrochloric acid, and then used to stir the solution in the tumbler, when the solution will become clear. If another glass rod is first dipped in a solution of soda, and then used to stir the liquid in the tumbler, the liquid will become red again.

This happens because the liquid is made alternately acid and alkaline by the liquid clinging to the stirrer; and the phenolphthalein indicates the condition of the liquid by making it clear when it is acid and red when it is alkaline.

COLOURLESS LIQUIDS THAT BECOME BLUE

ANOTHER interesting experiment that can be performed before friends is to make a blue liquid by mixing two colourless ones.

To a glass of water add just a little solution of copper nitrate. The resultant mixture should still be colourless. If a little liquid ammonia, also a colourless liquid, is added, the liquid will become a beautiful blue colour. This is because the ammonia precipitates the copper in the copper nitrate and redissolves it, making a blue salt known as ammonio-nitrate of copper.

REMOVING THE COLOUR FROM A BLUE LIQUID

IF a little diluted nitric acid is added to the blue liquid produced before, the liquid becomes colourless again. This is because the nitric acid splits up the blue salt into two separate compounds, nitrate of ammonia and nitrate of copper, and so removes the colour, and each is separately dissolved in the water.

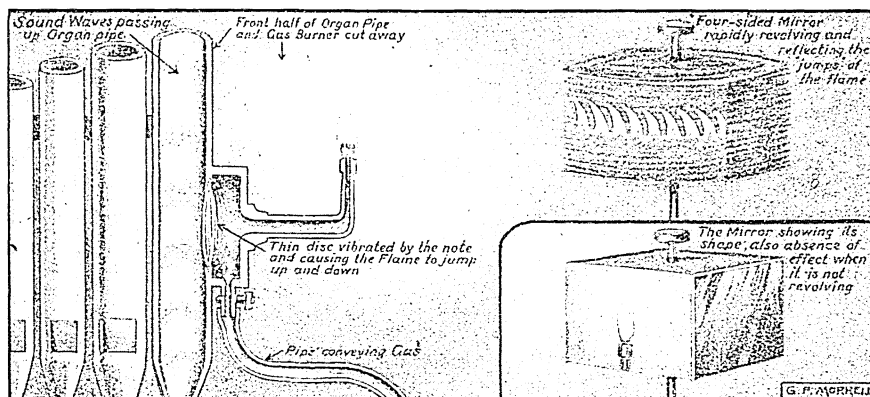
A POWDER MADE FROM TWO COLOURLESS LIQUIDS

IT often happens in chemistry that by mixing two colourless liquids a white powder is formed. This is known as precipitation, and the powder is a precipitate.

An excellent example of this is the test for the presence of chlorides. Add a few drops of diluted hydrochloric acid to half a tumbler of water. To this solution add a few drops of solution of silver nitrate, and it will be seen that the mixture immediately becomes milky. This is because the chlorine of the hydrochloric acid combines with the silver of the silver nitrate to form silver chloride, which is insoluble in water and so becomes the precipitate.

Common salt will do equally as well as hydrochloric acid for this test, which will detect as little as one part chloride in 108,000 parts of solution.

The Story of the Boundless Universe and All its Wondrous Worlds



Resonators of various forms have been devised with the object of making sound waves appear visible. In the type shown above a gas flame is made to rise and fall by the vibrations of musical notes. A four-sided mirror is kept revolving, and in this the flame is seen as a rapid succession of flickering tongues

THE BEHAVIOUR OF A SOUND

WE have been reading of music ; let us go a little more carefully into the question of over-tones, or harmonics.

We can study it very well by taking a single string stretched between two points over a sounding-board. That is practically the same as a fiddle with a single string. Everyone knows that a fiddle string may be sounded by being plucked with the finger, or by being played with a bow ; and we all know that the kind of sound produced by bowing is vastly different from the sound produced by plucking.

This is quite apart from the length of the sounds, for a clever fiddler can produce exceedingly short sounds with his bow, and yet these, though of the same pitch and loudness and length as when the string is plucked, are utterly different in quality. We know already that this difference must be a difference in the over-tones, and so it is.

Our ears tell us that the sound made by the bow is richer and more lovely than the sound made by plucking, and this is because the bowing throws the string into vibrations in little pieces, so to speak, as well as over its whole length. These partial vibrations produce the over-tones

which make the richness of the sound. So here we observe that a string behaves in two very different ways. When a piano or a fiddle string is struck or plucked there is produced what is called a free vibration. The string is disturbed for a moment, and then the thing which disturbs it is removed, and the string vibrates freely for a greater or less time—a long time in the case of a piano, a short time in the case of a fiddle.

In a piano, for instance, the strings are always meant to be played in this way, and everything is done to make the tones as rich in over-tones as possible, even though they belong to the class of free vibrations. Resonators, for instance, are used to give back sympathetic vibrations to any particular tone, and to help to magnify the sound ; but, quite apart from resonators, the kind of string makes a great difference. We know that the pitch of a note depends on the tightness of the string, which is what the tuner corrects when he tunes the piano ; it depends also on the mass of string, and on its length.

Plainly, therefore, it should be possible to get one and the same note from a long thin string and from a short thick one,

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and this can actually be done ; or, rather, it will be one and the same fundamental note in both cases, with a difference when it comes to the question of over-tones. Then we find that, though the two strings produce the same fundamental note, it is a more rich and beautiful note when it comes from a longer, thinner string than when it comes from a shorter, thicker one.

Everyone knows how utterly different is the sound of the bass notes of a good piano and the same notes of a cheap one. One of the chief differences is that the good piano uses longer wires to produce the low notes.

WHY A GOOD PIANO MAKES BETTER MUSIC THAN A BAD ONE

Two pianos of the same size may be very different in the quality of their lower notes, and when we open the pianos we find that in the better one the longer wires have been run at an angle across the shorter ones, so that greater length has been obtained. That is what is meant when it is said that a piano is overstrung, as all but the cheapest pianos are nowadays. The point about overstringing is to get length of string, and the point about length of string is that this is the best way of making low notes.

It is difficult to say exactly what happens when a string vibrates and produces over-tones. We know that, in the first place, the whole string is swinging from side to side, and then it seems that, on the top of that swing, various sections of the string are also making little swings of their own, each of a certain rate, according to the length of string that is swinging. This is how over-tones are made.

When a string is bowed it is made to vibrate in a different way, and in this case it vibrates only when the bow is being drawn across it, and stops immediately afterwards. It only vibrates when the bow forces it to, and so these are called forced vibrations, as distinguished from free vibrations.

THE FIDDLE STRING THAT CAN BE MADE TO LAUGH OR CRY

The difference between a great fiddler and a poor one is about as great as can be, and this is true though the fiddles may be the same. The secret lies in the bowing of the great player. When he plays a single, long note, it is a single note, and yet it is many notes ; he can make the string laugh or cry at will.

The reason is to be found in the extraordinary sensitiveness of a string undergoing forced vibration. Changes in what the bow does to the string, so minute that no one can describe them or define them, or say where they begin or end, or what they consist of, will utterly change the quality of the sound. The reason, of course, is that the string is vibrating in a different way, and so is producing a different set or a different proportion of over-tones in addition to its own proper note, which does not change except when the string is stopped. And the virtue of the good fiddle is that the body of it is somehow so made as to respond to the behaviour of the string as sensitively as the string responds to the bow.

There is a very interesting experiment which anyone can make with a good piano. As a rule, when we play a note on the piano, none of the other notes have much chance to sound, because the dampers are resting on them. When we hold a note down we raise the damper.

Let us, then, hold down the following notes, not striking them, but raising the damper, so that if anything makes the string vibrate it shall be free to do so : C in the bass clef, the C above that, the E, G, and B flat above that. When we have done this let us strike loudly the low C below the bass clef, and let it go. If it is a good piano we shall now hear a soft, sweet chord made up of the five notes which we have held down but did not strike. Something has struck them, and the explanation of this is very interesting.

WHY THINGS JINGLE WHEN WE PLAY THE PIANO

The low, long string which we struck vibrated not only as a whole, producing the note proper to itself, but also in a number of pieces of various lengths corresponding, as it happens, to the five notes we had previously held down. When the note is struck in the ordinary way these over-tones can only be separately distinguished by well-trained ears, but we have made them stand out in our experiment, because we stopped the loud note when we let go the key we struck.

This did not stop everything, because when the air waves that made the over-tones came each against the piano string that corresponded to the particular over-tone, that string was thrown into what is called sympathetic vibration. Other strings are not affected because they cannot

vibrate at that particular rate; but sympathetic vibration means that waves travelling at any rate will set vibrating anything that can vibrate at the same rate. This is the reason why things jingle when we play the piano.

This instance of sympathetic vibration will help us to understand the behaviour of resonators. To begin with, we know that some things will resonate and others will not. A clock or a watch has a very different tick when laid on a hard table from what it has when put on cotton-wool; and when we want to hear a tuning-fork well we do not hold it in the air, but press the stem on something firm and hard.

We know that the strings of a fiddle without the body make very poor sounds; and it is astonishing how poor is the sound of a piano string outside the piano.

THE BEHAVIOUR OF A NOTE OF MUSIC OVER A JUG OF WATER

But this must not lead us to suppose that one resonator is as good as another. On the contrary, there are special rates of vibration to which special resonators can respond—rates to which they are sympathetic, we might say, as we saw in the case of the sympathetic vibration of the piano wires. If we take a long vessel holding water up to a certain height, and then sound a tuning-fork and hold it over the vessel, we may find that the sound is immensely enriched and increased. If now we add a little to the water, or pour a little out, holding the tuning-fork over the vessel makes no difference in the sound, or only very little.

In this way it is possible to make various kinds of instruments, consisting of a number of resonators arranged in an orderly way. If we have little flames opposite the mouths of these resonators, the flames will flicker when the corresponding resonators are vibrating, and only then. So we can see the over-tones, in a sense, and thus can find them out, though we may be unable to detect them by means of our ears. This is called the tuning of resonators, and the first man who really studied it was the great German scientist Helmholtz.

THE WONDERFUL CORDS OF THE HUMAN VOICE

But the tuning of resonators really dates from before the days of Helmholtz, who knew what he was doing, and we, as we tune our resonators every day, which we do, do not know what we are doing. Wonderful though other musical instru-

ments are, and more especially the fiddle, the voice really beats them all, and the reason is that no other instrument has ever been invented in which we can tune the resonators we as go along.

In our experiment with the piano the soft chord we heard really came, in the first place, from the wire which we struck; and, similarly, all the over-tones of the human voice, whether in speaking or singing, are produced by the vocal cords. The marvellous richness in over-tones of the vibrations of the vocal cords is made yet more marvellous by the fact of their extreme shortness. The vocal cords of a bass singer, say, roughly, an inch long, may rival in number and richness of over-tones a fiddle string many inches long, or a piano string many feet long. Now, the vibrations of the vocal cords are forced vibrations, and we know that, other things being equal, forced vibrations are always richer in over-tones than free vibrations.

The chest and the cavities of the mouth and nose make the resonators for the voice, and these differ from all others in that they can be changed from moment to moment, and changed appropriately. For the lower notes the principal resonator is the chest, and its use is in reinforcing the lower over-tones. It does this best when it is well expanded, and therefore a singer produces far more resonant low notes when there is plenty of air in his lungs than when the air is nearly all expelled.

A GREAT SINGER'S MARVELLOUS POWER OVER LANGUAGE

But all the different qualities of tone which decide which vowel the singer is singing, and, apart from that, control so much the quality of the voice, and its effect on our minds, are due to the higher over-tones. These are affected by the upper resonators, the shape of which we can instantly control within a wide range.

From the practical point of view, the power of tuning our resonators is of the greatest importance, because it gives us the power of producing different vowels. Therefore, all the difference between the lowest types of human language, and the higher types of language, rich in vowel sounds, is due to the laws of resonators and the fact that we can tune our resonators as we please.

The good singer goes even farther than the highest language in this respect; he does everything that the language does, and more. It is true that the bad

singer often spoils the vowels of a language, and makes them all nearly alike. By so doing he prevents us from understanding the words he sings, and he also loses all the value of variety in vowel tones.

The good singer not only uses variety and makes the most of it, sounding his vowels much more purely than most of us do when we speak, but he also tunes his resonators from moment to moment, so as to make the tone cold or warm.

For this purpose he uses everything that is at his disposal for tuning his resonators. The extent to which the mouth is opened, the exact position of the lips, of the tongue, and of every part of the throat, from its roof downwards; all these modify the tuning of the upper resonators, and are under the perfect and easy control of the great singer.

HOW THE OVER-TONES ARE PRODUCED IN THE PIPES OF AN ORGAN

It is not by any means only stretched strings that produce over-tones. The same is true of pipes, such as the pipes of an organ, a flute, a clarinet, or a bassoon. These vary very much in their quality, and the variations are due to the differences in the over-tones. In each case the column of air in the pipe is not only vibrating as a whole from end to end, but also in sections, and thus the over-tones are produced.

It is helpful to study the behaviour of such a thing as a plate. Many years ago, careful study was made of plates clamped in the middle, and then made to vibrate by having a bow drawn across the edge. If some fine sand be spread over the plate, we now notice that the sand is thrown into certain patterns, these patterns changing according to the method of bowing.

The sand is thrown from the part of the plate which is vibrating most and will tend to be heaped up on the part which is moving least, wherever that may be. We find, then, that in every case there are certain definite lines on the plate which are moving least, and on which the sand gets heaped. These points are called *nodes*, from a Latin word meaning knots.

WHY VIBRATING STRINGS MOVE QUICKER IN SOME PARTS THAN IN OTHERS

But the importance of nodes is not only due to the fact that we find them in the case of plates. When we carefully study a stretched string we find that there are certain places along the length of the string where it moves least, and these are

the nodes. We know that the string is always moving as a whole; but, apart from that, it is also moving in pieces, producing the over-tones, and these pieces lie between the places where the nodes form. The simplest and commonest over-tone in the case of any string is, we find, one that is just an octave higher.

We have already learned the rule about the vibration of a string, that the shorter it is the quicker it vibrates, other things being equal. So when the over-tone is an octave above the fundamental tone, it must be that the string is vibrating in half its length, as well as its whole length. Half the length will mean double the number of vibrations in each second, and that will just make the octave. We should expect, then, to find a node formed half-way along the string, and so it is. Other nodes also form, corresponding to the particular over-tones in each case. Under proper conditions we can see these nodes when a stretched string vibrates.

Of course, in the case of very high over-tones, it must mean that the string is being cut up, so to speak, into a large number of small lengths, small enough to correspond to the high pitch of the over-tone; and this is so.

THE COMPLICATED SOUND WAVES PRODUCED BY AN ORCHESTRA

We know that the loudness of a sound depends on the width, or *amplitude*, as it is called, of the swing of the air waves, and that depends, of course, on the width of the swing of the thing that makes the air waves. So, in this case, we should expect that if the swing of the pieces of the string gets smaller the shorter they are, the over-tones must get fainter the higher they are, and that is what happens.

We must not allow our minds to be confused with the idea that somehow or other it is possible for any particles of air or any parts of a string to be in two places at the same time. And so, when a string is vibrating so as to produce both a fundamental note and also several over-tones, it is not really doing any of the things that we fancy it does, but something which is the result of all of them. No part of it can be in two places at the same time, and the actual movement of the string is an immensely complicated one. So, also, are the waves of air produced by this motion.

This becomes still more extraordinary and difficult to understand when we try to imagine how complicated must

THE BEHAVIOUR OF A SOUND

be the sound waves produced when a number of instruments and voices are all sounding together. The wave which reaches the ear is an immensely complicated sort of blend, or compromise, between all the different kinds of waves that have been produced. A very interesting way of studying sound waves is to be found in the gramophone, about which we read in another part of this book.

We can make the phonograph record the waves corresponding to an orchestra or to any kind of sound, simple or complicated, music or mere noise, and the marks made on the wax by the phonograph needle can be studied by means of the microscope, or they can be photographed, and greatly magnified.

There is an interesting way of studying sound by turning it, as it were, into something that can be seen. We saw this, also, in the case of the flames which were made to flicker when the resonators opposite them were thrown into action.

TYNDALL'S VOWEL FLAME THAT RESPONDS TO HIGH NOTES

Professor Tyndall invented what he called a vowel flame, which, when nothing disturbs it, is about two feet high, but certain sounds will make it so short that it can scarcely be seen, and then, when the particular sound stops, up it will jump again. It is called a vowel flame because it can tell one vowel from another, so to speak. The flame is specially sensitive to high notes, and is therefore much more affected by vowels which are made by high over-tones than by those which have lower over-tones.

The highest pitched of the vowels is *e*. Anyone will agree with this who will whisper the various vowels all on the same note, and there will be no doubt that, though they are all on the same note, yet *e* is the highest of them all. The reason is that, though the fundamental note is the same for each of the vowels as we are whispering them, the over-tones of *e* are the highest. Now, if we say *oo*, as in boot, to the vowel flame, it will do very little; but if we say *ee* to it, as in feet, it will almost disappear. When we stop, it jumps up again.

Sensitive flames can be used for more strictly scientific purposes. We have seen already that they can be made to show which of a set of resonators is being thrown into action by a certain sound. This test can be applied to the study of

sounds, notably to the study of the vowel sounds, which are more numerous than may be supposed by anyone who speaks only one language. When we learn French we all know how different some of the vowel sounds are, and really the total number of possible vowel sounds is very large.

HOW MEN CAN WATCH A SOUND PLAYING WITH FIRE

This is entirely a matter of the over-tones, and they can be studied by speaking into a little machine in such a way as to affect a flame, and we can study the shape which the flame takes in different cases. In fact, we may say that we can actually watch a sound playing with fire! There is a likeness between the shape of the flame in such cases and the shapes of the marks which the same sounds make on wax by means of the phonograph.

When a wave strikes a breakwater and comes back again and meets the next wave, the two will clash and interfere with each other. At times the two crests will come together and will make a very high crest; at other times the crest of one wave will meet the trough of another, and each will tend to spoil the other. This effect of one wave on another is called interference, and it is true of all kinds of waves.

We can study interference in a small way by throwing two stones into a pond, and seeing what the one set of waves does to the other.

Interference in sound waves produces a most interesting result. It means that if we have two notes sounding together that are very near in pitch, but not the same, the waves will interfere with each other, and we shall get what are called beats; the sound will seem to throb, or beat. When the two waves are helping each other, the sound gets louder; when they are spoiling each other the sound is fainter. This beat is very unpleasant.

HOW CERTAIN DISCORDS MAY BE USED TO IMPROVE HARMONY

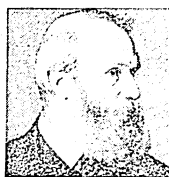
Part of the objection to what we call discord is that the waves made by the various notes are capable of interfering with each other, and so we get beats, or throbs. But different people vary very much as to what they find nice in the way of discords, and the right use of certain discords in music is invaluable because it enormously increases the effect of the harmony on our ears.

THE MAN WHO FOUND THE NORTH POLE



ROBERT PEARY AS HE WAS IN THE CROWNING HOUR OF HIS GREAT ADVENTURE

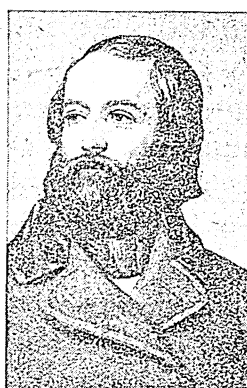
The Story of Immortal Folk Whose Work Will Never Die



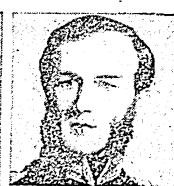
B. Leigh Smith



Sir George Nares



Elisha Kent Kane



Sir E. A. Inglefield



Dr. S. A. Andrée



Major F. G. Jackson

THE NORTH POLE MEN

YOUTH would be old; age would be young. We may hear boys and girls proudly asserting today that they are old enough for the South Pole to have been discovered in their time, only to be put down by somebody two years older with the severe retort: "But *both* Poles have been found since I was born!"

What centuries of brave endeavour have thus yielded their acrid fruit, a double, final harvest in the lifetime of our striplings. Four hundred years of bitter striving, of suffering innumerable, of hardship beyond description; then, in just over two years, the frozen ends of the Earth are reached, once in the North, twice in the South.

It might seem as if Nature, terrible and savage in these untrodden ways of the Earth, had suddenly relented and admitted men with grace and kindness into her sinister realms of silence. But no, she was merciless to the last, and devoured the most picturesque of her wooers.

There are but a few men in the Farthest South, and they are dead. Many tracks lead to the Farthest North, and each is marked out by dead men's bones. The adventurers all went voluntarily to their doom, knowing the possible cost. They did not expect to die by the way, but the hazard is one of the greatest a man can

challenge, and captains and comrades staked their all on it, and where they failed they failed sublimely.

How could they nerve themselves to the terrors of such a quest? They knew, much better than we, the full story of the sufferings and disillusionment of the men who went before them about the world, down into the great South Sea, up into the Arctic with its nerve-racking winter night.

The mists of romance were all dispelled, and the stern truth of the risks to be run, the sufferings to be endured, the likelihood of starvation, disease, and the slow agony of life ebbing inch by inch were all foreseen. There was, after all, no short cut to the romance and riches of the East, no seaway from the Atlantic to the Pacific and its fabled treasures, save one which took two years to compass, amid appalling danger and hardship.

The search for the Poles had in it no promise of wealth, no smiling romance; only the great threat of inevitable peril and privation, the remote hope of unrewarded arrival as the goal. How can human nature nerve itself to face an ordeal so unnatural?

From the first adventurer to the last they have all tried to admit us to their feelings on the matter, and none of them has succeeded better than a Viking, who

EXPLORERS · INVENTORS · WRITERS · ARTISTS · SCIENTISTS

wrote six centuries ago of his compatriots of an earlier age.

If you wish to know (wrote this Norseman) what men seek in this land, or why men journey thither in so great danger of their lives, then it is the threefold nature of man which draws him thither.

One part of him is emulation and desire of fame, for it is man's nature to go where there is likelihood of great danger, and to make himself famous thereby. Another part is the desire of knowledge, for it is in man's nature to wish to know and see those parts of which he has heard, and to find out whether they are as told or not.

The third part is the desire of gain, seeing that men seek after riches in every place where they learn that profit is to be had, even though there be great danger in it.

But a money reward was never, even in the earlier stages of the struggle for the Poles, a serious factor. The days of pretence and illusory hopes had passed. There is a grim Viking jest still on the map to tell the tale of cheerful deceits to cozen men towards these frozen wilds in the brave days of old. When the Iclander Gunnbiorn was carried away by a gale into sight of a great white land, sheeted with snow, he named the place White Shirt Land. Eric the Red came later to the same scene.

THE NAME THAT WAS TO BRING PEOPLE TO GREENLAND

"What shall we call this land?" his men asked him.

"Call it Green Land," said he.

"But it is not a green land," said they.

"It matters not," quoth Eric; "give it a good name and people will come to it."

And that is why the land of the icy mountains received its name.

It was no such trick that beguiled the Polar men to the North, for they knew the story. Equally idle was Martin Frobisher's tale of mountains of gold. "If what you say about Frobisher be true," wrote Hubert Languet to Sir Philip Sidney, "you have stumbled on that gift of nature which is, of all, the most fatal and baneful to mankind, yet which most men so madly covet. I fear that England, crazed by the love of gold, will now empty herself into these islands that Frobisher has discovered."

The gold was worthless ore; Frobisher's supposed continents of Asia and America

were the shores of the bay which bears his doughty name, and all the story was known to the men who followed after.

We have covered the greater part of the Arctic explorations already, and now we must press on to our goal, the track marked for us by Sir John Ross, his nephew James Clark Ross, and the indomitable William Edward Parry. We pass the scene of the bitter tragedy of Sir John Franklin and all his men, and see the crowning of his life-bought victory in the discovery of the North-East Passage by Adolf Eric Nordenskiöld, and the North-West Passage by Roald Amundsen.

THE DISCOVERIES OF THE MEN WHO SEARCHED FOR SIR JOHN FRANKLIN

All this time men were battering at the ramparts of the Pole itself, the attacks proceeding from many countries, from the Old World and the New. Much that was done had the search for the bodies of Franklin and his crews as the actuating impulse, but accident or design opened the way more and more to the secret door. Thus Sir Edward Augustus Inglefield, in 1852, found no Franklin traces, but he did find Cape Sabine and Ellesmere Island, which he named, and achieved the Farthest North up to his time.

A year later Elisha Kent Kane, born in Philadelphia in 1820, by profession a doctor, and by every instinct a true rover, sailed as surgeon in an expedition fitted out by Henry Grinnell of New York. A subsequent expedition was under his personal control, and produced notable results, the fruit of appalling hardships.

THE SPLENDID ESKIMOS WHO LED THE WHITE MEN TO THEIR GOAL

The Eskimos knew nothing of the Pole; little, indeed, of anything beyond the art of living in barely supportable conditions, yet they were the ultimate guides for white men to the desired goal. Kane was the first man systematically to woo their aid and profit by it. There was a tremendous figure in his travels, Hans Hendrik of Greenland, a 19-year-old native of ability, adroitness, and charming fidelity. He could grapple with a bear and spear a bird on the wing. There was old Kalutunah, chief of the Etah Eskimos, whose descendants Peary was to meet. Kalutunah had the dignity, grace and courtesy which we ascribe to the Red Indians; a lion in the chase, a master of craft with the snare, one of Nature's gentlemen in his relations with friendless strangers.

THREE FAMOUS POLAR EXPLORERS



PEARY AND HIS DOGS CROSSING AN OPEN CHANNEL IN THE ICE



CAPTAIN OTTO SVERDRUP WITH HIS DOGS
ON THE DECK OF THE FRAM



DR. NANSEN TALKS OF HIS ADVENTURES
TO SCHOOL CHILDREN AT TRONDHJEM

Between them they taught Kane's men to hunt the bear and to fill their larder with wild birds. The birds were the little auks, with which Arctic airs teem at times as English streams with mayflies. The method was to make a little net of sealskin, mounted on a ten-foot pole, to crouch behind the brow of a hill over which the birds would fly in from sea, then raise the net and catch them like butterflies, a score at a time. Then, taking the birds out one by one, this little king of the wilds bit each once through the head, and in a twinkling had the net up for another haul, so that over 100 were ready for the strangers' dinner in the briefest space.

Guided and assisted by Eskimos, Kane made valuable discoveries; found and named Kane Basin, and fought his way into Kennedy Channel, and passed several miles north of Inglefield's record. His actual discoveries now seem insignificant in retrospect, though most essential links at the time; but Kane will always remain famous for his great sledge journey when his ship, ill-found, and ill-fitted for winter work, became fastened in the ice.

THE STORES OF FOOD RAIDED BY THE HUNGRY BEARS

For the sledge journey men were sent on ahead to deposit stores for the later party. They experienced dire misfortune, and two perished of cold. When Kane set out he nearly met the fate which later befell Captain Scott, for his supplies proved short.

Bears had easily tossed aside protecting stones which it had taken three men to place in position, and the food had been eaten, and barrels of fuel smashed to pieces. Scurvy naturally attended scarcity of food; the doctor himself was a victim, and had to be carried lashed to a sledge, his legs rigid and useless.

In the second summer the ship failed to free herself, so a second winter in the ice had to be faced. There would have been another disaster like that of Franklin's but for the Eskimos. With these Kane had a treaty. They were to refrain from pillaging the ship in the absence of the sledging white men, and were to furnish fresh dogs and meat. In exchange the visitors were to help them in hunting and to give them needles, knives, and other trifles. Nobly the Eskimos performed their part, and so the voyagers were saved from starvation.

But there seemed no prospect of ever freeing the ship, and it became necessary to make a great sledge trip to Beeching Island to obtain help. The details of the final escape are terrible.

Yet the result was to send more and more men flocking North on the same trail. Dr. Hayes, Kane's assistant, carried the torch farther, but made grave mistakes through inexperience of surveying, a fact due to the death of gallant Sontag, his scientist, frozen to death on a sledging trip. Yet his work was productive of useful result, and was a beacon which other men followed.

AN AMERICAN BLACKSMITH'S FIVE YEARS OF LIFE AMONG ESKIMOS

One of the strangest of his successors was Charles Francis Hall, a Cincinnati blacksmith turned journalist, a native of Rochester in the United States. He first had experience of the sea when he set forth as commander of an expedition, in 1860, in search of Franklin. He was away two years. He returned to his search in 1864, when he found some of the bones of the hapless party, and for five years lived among Eskimos, as Stefansson was to do in our own time.

In 1871 he was off again, in command of the American Government steamer *Polaris*, and reached a point 250 miles up Smith Channel, the farthest yet, dying of illness produced by privation and hardship in winter quarters at Thank God Harbour, Greenland, in the November of the year of his departure. The *Polaris* trip was famous for its discoveries, and also for the fact that 19 of its men went adrift with stores on an icefloe and cruised from October, 1871, till April of the following year, when they were rescued at the point of death by a whaler. The *Polaris* never reached home, and the remainder of the crew made a great voyage in open boats through the icy sea, to be picked up finally off Cape York.

THE LITTLE BLACK HOUSE ADRIFT ON THE GREAT ICEFLOE

Germany entered the field in 1868, and, after a preliminary survey, sent out the *Germania* and the *Hansa* in 1869. Advances on old lines were made, but the attempt was notable for the loss of the *Hansa*. The ships became separated, and the *Hansa*, caught between two promontories of ice nearly 40 miles off Sabine Island, was frozen in. The crew thought their plight was but temporary, but,

DR. NANSEN ON HIS FAMOUS JOURNEY



DR. NANSEN AND LIEUTENANT JOHANSEN LEAVING THE FRAM FOR THEIR GREAT JOURNEY



DR. NANSEN OUTSIDE MR. JACKSON'S HUT
IN FRANZ JOSEF LAND



THE DRAMATIC MEETING OF DR. NANSEN
AND MR. JACKSON

having a quantity of coal briquettes aboard, took the precaution to build a number of these into a house on the ice. It was only necessary to fill the cracks with powdered snow and pour water on it, and the place was airtight in ten minutes.

But the Hansa was destined never to sail again. The icefield began to turn bodily, and she was lifted up and smashed to pieces. The floe on which they were housed, primarily two miles in diameter, was ultimately reduced to 150 feet, yet on that they lived through the winter, and in the following spring took to their boats and reached safety.

A very similar fate attended the first Austrian expedition in 1871, when Lieutenants Carl Weyprecht and Julius Payer, after a preliminary dash in the preceding year, steamed up to try a new route towards the Pole, beyond the north-east coast of Nova Zembla. They set out on July 14 and, 37 days later, were seized by the ice and made prisoners. It was not a matter of being anchored by the forces of Nature to a fixed position: for nearly two years they were dragged about the northern ocean, whithersoever currents carried the icefield to which they were attached as unwilling passengers.

A N EXPLORER'S THRILLING ADVENTURES AND HIS DASH IN SEARCH OF HELP

Never were men more impotent. They saw no land till August 30, 1873, when what we now know as Franz Josef Land burst on their view with the sudden lifting of the fog. Yet, so tantalising was fortune that two months elapsed before they could land. Terrible experiences befell them when they did. Payer, with two men, dogs, and a sledge, set off to explore, and a snow bridge collapsing beneath their feet, down went sledge, dogs, and one of the men, the whole weight being borne by the rope by which Payer was attached to the vehicle.

"The rope is cutting me in two; I must sever it!" he called to the man below. The sailor begged him not to do so lest it should involve the death of himself and the dogs; but Payer, assured by the other seaman that there was a ledge below the point at which the sledge was resting, did cut the rope, and the sledge, with the man and the dogs, spun down another ten feet and came to rest.

"Now keep yourself from freezing for four hours while I fetch help!" shouted Payer, setting off with his other com-

panion to run six miles through deep snow back to the camp.

We boast of our modern Marathon and Olympic runners, but that desperate effort to save life by speed and strength must have been a greater trial than the feat of Ladas which these contests commemorate. Payer was too fast for his companion. He stripped off his bearskin clothes, his boots, and gloves, to lighten his burden as he ran, and sped with only thin stockings through the snow and over the cutting ice. But he found his men, and was back with them at the crevasse, and had dogs and man up safe and sound within four and a half hours of their fall.

THE FINE STORY WHICH CAME TO LIGHT AFTER HALF A CENTURY

And that did not exhaust Payer's adventures. The end of the sledge journey came, and it was necessary to return to the ship for food and help. All but two of the dogs had been eaten and these two bore him wearily on ahead of the rest of the party, over perilous ways, over icy slopes and rocky hills. But the ship was nowhere to be seen. It appeared as if the relentless ice had carried her off again. At last, mounting an ice-cliff, Payer caught sight of her, a speck in the distance. He was too feeble to cry to his dogs or make them understand. He seized the head of each in turn in his hands, held it towards the ship and pointed, till he saw their dull eyes gleam and their frost-cracked ears prick up. Then away they went, with no command, no urging, and brought him in safety to the vessel.

That vessel was finally abandoned after two years of cruising at the will of the ice. He dropped overboard a record of his adventures and departure from her and it was found in 1921, nearly half a century later, by Professor Olaf Holtedahl, of the Danish expedition to Nova Zembla, after all those years of wandering with the current from Franz Josef Land, southward to Spitsbergen, along the coast of Finmark, and the White Sea, and northward to Nova Zembla.

TWO NINETEENTH-CENTURY MEN OF THE ELIZABETHAN TYPE

Two other fine names that come into the story at this point are those of Englishmen, James Lamont and Benjamin Leigh Smith, nineteenth-century men of the Elizabethan type, who fitted out yachts and sailed North in quest of sport and knowledge. Lamont was the discoverer

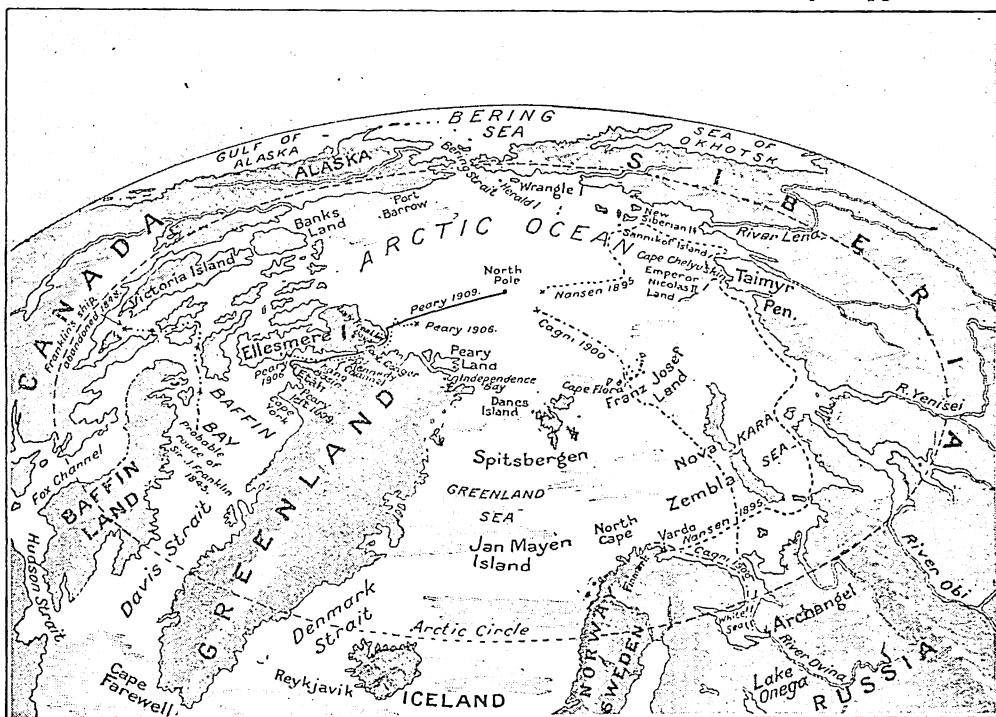
THE NORTH POLE MEN

of coal in Spitsbergen, which is now an important Arctic industry. In three days his men got ten tons of it aboard, its seams and fissures filled with water turned to ice.

Leigh Smith was one of the knight errants of Polar effort. He was a man of means, scholar, barrister, man of action. He went north five times, and at his first essay was just in time to redeem a desperate involuntary colony on Spitsbergen, where the chivalrous Nordenskiöld, head of a Swedish expedition of 24 men, had found 101 mariners starving amid Spitsbergen ice, and endeavoured to feed them through the winter on supplies meant for a fifth that number of mouths.

with winter still upon them, they had come almost to the end of their resources, when fortune sent eight bears to be converted into food for the hapless seafarers.

It was with sails of tablecloths and shirt-tails that the cheery Leigh Smith eventually got his boats away when summer came, and he reached home in safety because a storm blew him out of his course to the position at which had arrived the very ship sent out from home to seek him. We owe to this nonchalant hero much of our knowledge of Arctic deep-sea temperatures and currents, as well as some hundreds of miles of new coast line within the Arctic Circle faithfully mapped.



THE REGIONS ROUND THE NORTH POLE AND THE WAY THE EXPLORERS WENT

All must have perished had not the easy-going Smith sailed in and rescued them.

Smith was the second discoverer of Franz Josef Land, arriving there in his own yacht, the Eira, six years after Payer had left. The Austrian vessel had vanished, but the ice seized another hostage in its place, the newly-arrived Eira, which was nipped and smashed and sunk in 66 feet of water before the 25 officers and crew could do more than erect a tent and snatch a few stores. They wintered in a house made of stones and mud, and supported themselves in the main on the flesh of bears, walrus, and birds; but once,

We see how one man's feats and failures led to other men following, but in tracing the succession of men and events, we are led to depart from the strict order of progress, owing to the number of the paths men followed. We must retrace our steps, then, to the middle of the nineteenth century, to note the work of Sir George Nares, famous, as Franklin had been, for fighting, administrative work, and, of course, as the commander of the Challenger expedition. The Government called him home, when they heard of the success of Hall in the *Polaris*, gave him three little ships, and bade him find the Pole.

All the stories of suffering, privation, and death which attended these Arctic expeditions were well known about the world at this time, yet what do we find when crews for the Nares 1875 expedition were desired? A naval officer entered the Portsmouth headquarters of the expedition and said, "An order has come on board my ship directing me to send volunteers for Arctic service to this office. Well, what am I to do? The whole ship's company, numbering nearly 800 men, have given in their names!"

A UNSOLVED MYSTERY OF LIFE IN THE FROZEN NORTH

The expedition did not reach the Pole, but its outposts got to within 399 miles of it, the nearest that man had ever been. The results to geography, geology, and natural history were important. Far north, on what we call Washington Irving Island, a cairn was found, very ancient, lichen-grown, like a relic of some previous creation, yet, as the party were able to say, clearly the work of white men's hands. Who made it? How came it there, symbol of civilised life of a long ago in that little isle of heart-breaking desolation?

They found the nest of a sanderling, still preserved in our Natural History Museum. It was in latitude 82, and near at hand were the cradles of knot and grey phalarope. There were very old Eskimo relics where no Eskimos have lived for ages, and there was coal, too, to tell of one-time brilliant sunshine and verdure like that of tropical Africa.

No one ever gave us a better idea of the cold and strength of nature's Arctic forces than Nares in this expedition. As winter descended there was a race between his men with their ship and ice masses for possession of a little sheltered cove. It looked as if the ice would get in first and block the harbour; but the men just won, dragging their craft tail-first into safety.

THE MEN WHO LIVED IN AN ICE-LOCKED SANCTUARY

The ice at once sealed the entrance, coasting by in such enormous masses that the fragments, the mere little protruberances at the points, broken off in grinding contact with the land, weighed 30,000 and more tons apiece. They piled up outside the harbour in blocks 300 feet broad and 50 feet high, and shut the men in in conditions so cold that the temperature was 105 degrees below freezing point. The very pipes the men smoked froze.

The story of the Nares sledging parties is famous but terrible. The work was so hard, the snow so deep, the hummocks so high, that they made but a mile in two hours, with trebled crews hauling at each sledge in turn, and scurvy descending on the party.

Let us return once more to Franz Josef Land, which the original discoverers thought to be a vast, unbroken mass of land, which Leigh Smith divided into smaller sections, but which yet remained the subject of geographical dispute. To settle the controversy the late Lord Northcliffe fitted out an expedition, and in 1894 sent out Mr. Frederick George Jackson, in the *Windward*. The expedition was exceptionally well provided with necessaries for making Arctic life tolerable and healthy, and Jackson, with his experience of the Australian deserts and the Siberian tundras, was well qualified by training and instinct for the task.

He established himself at Cape Flora in a hut which he called Elmwood, and there he dwelt a thousand days, ranging far and near, mapping what proved to be a considerable archipelago, and bringing home an unsurpassed collection of material for the instruction of Arctic science. Let us leave him there for a moment, that we may return to him in illustrious company.

THE EXPLORER WHO BURNED FOOD TO KEEP AN ENGINE RUNNING

In July 1879 Lieutenant George Washington de Long quitted San Francisco in the *Jeannette* to explore, on behalf of the United States Government, certain Siberian islands. Two months later he was fast locked in the ice off Herald Island. He was not daunted, for he had had thrilling Arctic experiences before. Once, in a little ship's steam launch, he carried out a daring search for the lost *Polaris* and her crew, and, his furnace being swamped amid charging icebergs and moving fields of ice, he was in danger of sinking, even if his boat were not smashed. Seas washed over him, flooding the launch and drenching all the fuel. Even the matches were saturated. But if they were to escape they must raise steam; and raise steam they did. Matches were kept for two hours in contact with the body of a seaman; then a few shavings were kindled with oil, and De Long burned pork to keep his engine running and the ship under way.

Such was the resource of the commander of the Jeannette, who, as we see, became frozen in in the Jeannette, off Herald Island, as he named his find, near the New Siberian Islands. For nearly two years the ship was held, then, the ice breaking away and re-closing, she was nipped and split asunder. The crew of 33 got away in three boats, and two detachments nearly all survived. But De Long and 11 of his 13 companions suffered the fate of Franklin and Scott. Two of their party were sent off, after many days of agonised wanderings, to seek relief, relief which arrived too late.

De Long and all the others were dead, starved to skeletons. They had hardly any clothes, they had burned their tent for fuel; they had lived on a teaspoonful of glycerine a day, then on a little sweet oil and hot water, and were found, with the leader's stiffened arm raised like a beacon above the snow, their bodies below, frozen hard to the ground. Like Scott, they lay 11 days in their camp of death; like him they were always near succour but too weak to reach it.

THE FAITHFULNESS AND HEROISM OF A CHINESE COOK

No other Arctic tragedy is so well documented as this, for there was the evidence of the survivors, there was the courageous diary of De Long. One of the most stirring things in the tragic episode was the fidelity and valour of a little Chinese cook, Ah Sam.

Starvation, misery, toil and terror, and frostbite which sheared the flesh off his bones, failed to depress his marvellous spirits. He was always bright, always working, always assisting his leader with his burdens, warming him with his own body. And when the corpses were wrenched free of the ice there was little Ah Sam's body doubled up beneath that of De Long. He had seen his master give Christian burial in a river to members of the crew who had died by the way, and little Ah Sam, the last of all to survive, died in the struggle to bear the dead body of his beloved leader for burial to the river near which they had made their last halt.

The world rang with the melancholy story of the Jeannette; and, with the recovery and interment on a mountain top in Siberia of the unhappy victims, it was thought that the end had come. But there was to be a startling sequel to the grim tragedy.

Three years after the Jeannette sank off the coast of Siberia she began to appear peaceably off the coast of Greenland. Wreckage, clothing, writing, arrived in a little stream, having come by current from near Bering Strait in Asia, right across the Polar Sea to Europe. Was there, after all, a short cut across that terrible ocean, by way of the Pole itself? It fell to Dr. Fridtjof Nansen, the Norwegian scholar and explorer, to solve the riddle.

DR. NANSEN'S TERRIFIC CHALLENGE TO THE DREADED ICE KING

Born in the capital of Norway in October 1861, he was at this time already famed for daring and initiative as a voyager in the Arctic, as well as for his scholastic attainments. To make a long story short, the wonderful little Fram, which means Onward, was built for him, and he set sail in it, in July 1893, not, like other explorers, to battle with the odds, but to take the line of least resistance, to let frost seize his ship and carry it through all its secret ways, whithersoever it would, to whatsoever goal destiny might decide; a terrific challenge to the dreaded Ice King.

Nansen steamed and sailed to the north Asian coast, round Cape Chelyuskin, to the New Siberian Islands, and, just north of Sannikof Island, moored the Fram to an icefloe, which refused to part company with her for the next 35 months. Where the ice field floated, there went the Fram with her, both borne by unknown currents. We cannot follow the details of her windings and twistings, but must content ourselves with the fact that she made the most tremendous advance into the North since the great days of Baffin, reaching latitude 85 and longitude 66, the highest north ever attained by a ship.

THE WONDERFUL VOYAGE OF THE LITTLE SHIP LOCKED IN AN ICY GRIP

She was in the hands of a very great sailor in Otto Neumann Sverdrup, in whose company it would be pleasant to linger, for he has written his name in letters of enduring record on the Arctic map. He it was who handled the Fram throughout and, after Nansen's departure, commanded the expedition on the ship. The Fram, in the third year, turned south and headed, still attached to her captor, toward Spitsbergen, so on June 3, 1896, Sverdrup determined to blast a way out into the clear water which he saw ahead. But the ice proved still reluctant, and the little ship was held and gripped again

and again for the next three months, finally breaking free from the ice in August of that year, 35 months from her entry into the field.

She raised steam and made for Danes Island in Spitsbergen, and had hardly cast anchor when the doomed Salomon August Andrée stepped aboard to pay a visit of congratulation. With Dr. Ekholm and their comrade Strindberg, the Swedish enthusiast was then and there preparing his mad, brave enterprise to fly by balloon to the North Pole. It was from there, soon afterwards, that he took the air, never again to be seen by mortal eyes. His fate remains one of the terrible mysteries of the Arctic, though only a dull imagination would fail to guess the hard facts.

But what of Nansen, whom we set afloat on the Fram, which we have permitted to wander with wind and current all this time without him? After his ship had tracked hither and thither, towed by an erratic icefloe for 20 months, Nansen saw that she would never reach the North Pole in time for provisions for the crew to hold out. So he took with him a brother spirit in Frederick Hjalmar Johansen, and set out with a dog team and a sledge to march to the coveted goal.

THE DEATHLESS STORY OF DR. NANSEN'S MARCH TO THE POLE

Johansen was a University man, born in 1867, who had been in the Norwegian army with commissioned rank, and was so determined to accompany Nansen that, other posts being filled, he went as a stoker.

These two, then, began their great march to the Pole in March 1895, and for the next 15 months looked on no human faces but each other's. To their sledge they added Eskimo boats, called kayaks and, in the face of appalling difficulties and perils, they achieved wonders. They were constantly menaced by bears; they were attacked in the water by walruses which rent the bottom of one of the two boats; they fell into crevasses; they were wet; they were frozen; Nansen was crippled by rheumatism. They came so near to starvation that once all they had to sustain them for an entire day was a dreadful meal of dog's blood.

Nevertheless, in three weeks they travelled 150 miles in regions far beyond the farthest point ever previously reached by man. But not the Pole. They had to turn back, in anticipation of winter, at a spot 86 degrees 14 minutes North.

Perhaps the threat of winter would not have deterred them had not the ice ridges been quite impossible to their strength. They turned south for either Spitsbergen or Franz Josef Land, and after a memorable march, which Nansen has splendidly described in his book, they at last quitted the ice and reached land. But where they were they did not know, for in a terrific 36 hours' struggle for safety over the frozen sea they had let their watches run down and could not take correct observations.

THE LONG REST OF THE EXPLORERS THROUGH THE ARCTIC WINTER

They thought they had reached a hitherto undiscovered island, but could not be sure. At any rate, there they had to stay for the winter, in gross darkness and bitter weather. Yet Fate was kind to them, for there was abundance of bears, and they lived on bear flesh and fat, and slept so prodigiously that at the end of it all Nansen's weight had increased.

With the coming of spring they resumed their march south-west, with many adventures. Once their two boats floated away without them, and Nansen had to pursue them through the freezing water. He was so cold that soon he could not swim, but had to float on his back to recover, and when he at last came up with them he was too frozen to get into them. He managed at last to effect the climb, then he was so enfeebled that he could not row, but had to kick his way through the water, first with several strokes with one foot, then, repeating the operation with the other foot, after balancing himself on the opposite side of the boat.

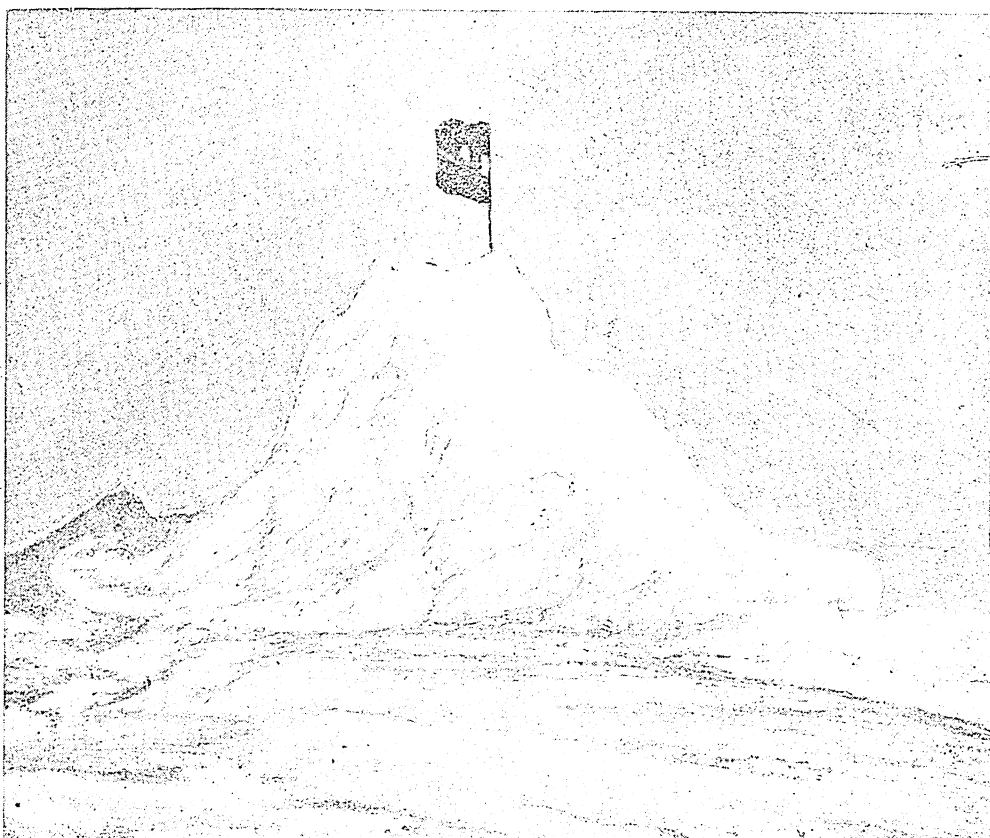
It was always touch and go with the indomitable pair; they were staring death in the face hour by hour. At last an astounding thing happened. Nansen heard a barking, and he knew that the sound could come only from a domestic dog, for wild dogs do not bark. He went out to explore, leaving Johansen with the tent and sledge among the hummocks.

THE ENGLISHMAN'S VOICE THAT CAME FROM THE GREAT WHITE SILENCE

He saw a distant figure, he heard a voice, and the voice was English. The man, for such it was, saw him. They hailed each other, and, with heads politely bared, approached with a hearty "How do you do?"

Nansen tells us what followed in a scene as memorable as the meeting of Stanley with Livingstone.

THE HARD WAY TO THE POLE



THE NORTH POLE AS PEARY LEFT IT BEFORE RETURNING TO CIVILISATION
From Admiral Peary's photographs in his book *The North Pole*, published by Hodder and Stoughton



A TERRIBLE ICE FIELD WHICH PEARY HAD TO CROSS ON HIS DIFFICULT PATH TO THE POLE

On one side, he says, was the civilised European, in an English reefer jacket and neat boots and gaiters, well shaved, well groomed, bringing with him a perfume of scented soap perceptible to the wild man's sharpened senses. On the other side was the wild man in dirty rags, black with oil and soot, with long, uncombed hair and shaggy beard, black with smoke, with a face in which the natural fair complexion could not be discerned through the thick layer of fat and soot which a winter's endeavour with warm water, moss, rags, and at last a knife, had sought in vain to remove.

The stranger was Jackson, whom we left some time ago in Franz Josef Land; and Franz Josef Land was still the setting, for it was in one of the islands of this archipelago that Nansen and Johansen had unwittingly passed the winter.

"I'm immensely glad to see you," said Jackson, without the least guessing the identity of the dirty wanderer. He was looking for Nansen, but never dreamed of the identity of the man before him.

THE WELCOME SANCTUARY DR. NANSEN FOUND WITH JACKSON

Nansen knew Jackson, for the two had met in London, and he imagined all this time that Jackson recognised him.

"Have you a ship here?" asked the Englishman.

"No; my ship is not here."

"How many are there of you?"

"I have one companion at the ice edge."

They were walking inland while thus talking. Suddenly Jackson stopped, gazed full into the wild man's face, and asked excitedly, "Aren't you Nansen?"

"Yes, I am."

"By Jove, I *am* glad to see you!"

He made Nansen tell him of the *Fram*, but judged that the ship was lost and that Nansen and Johansen were the only survivors, so that for hours later, when they reached the hut, no one asked questions concerning what they imagined to be the tragedy of it all.

However, all's well that ends well. The truth came out by accident, and there was such cheering from English lungs as never had the Arctic heard before.

"We've plenty of room for you both," cheerily said Jackson; and the "plenty" proved to be a few square feet on the floor of the hut not already occupied for sleeping by Jackson and his six companions.

The *Windward* arrived that year with stores, and though Jackson remained to complete his explorations, Nansen and Johansen returned by the ship to civilisation and high honour, and the knowledge that the results of his three years ordeal could be excelled only by the man who actually gained the Pole itself.

THE EARLY DAYS THAT PAVED THE WAY TO THE TRIUMPH OF PEARY

That remained still to do—and it was done, the hero of the achievement being Robert Peary, one of the most dogged and pertinacious heroes of Arctic endeavour who ever penetrated the region of ice and terror. Admiral Robert Edwin Peary was born at Cresson, in Pennsylvania, in 1856, was educated at Bowdoin College, Maine, and entered the engineering service of the American Navy, and gained experience for his future career as engineer of a survey through Nicaragua, where it was intended at the time to construct the canal which afterwards came into existence at Panama.

He explored the north of Greenland in 1891, marched across its great glacier fields, discovered and named Independence Bay, and crowned his list of trials by sustaining a broken leg, where surgeons were absent and medical comforts hardly to be had. But the ache could barely have been banished from his bones before he was back again, in 1893, for two years of work and study among the Eskimos of Smith's Sound.

As Kane had done earlier, he assiduously cultivated the friendship of the natives, mastered their language and habits, taught them his, learned to live their life, and also to make their dogs part of his living equipment.

THE LITTLE WHITE GIRL WHO WAS BORN IN THE ARCTIC CIRCLE

In the course of eight great journeys to the North, in which Peary beat all previous records before actually winning the goal, he demonstrated that a white man may live in the Arctic if he is prepared to follow the habits of the natives. Nay more, twice he was accompanied by his devoted wife, who was the first white woman to winter in the Arctic Circle. His daughter, Marie Peary, was born there in 1893.

Those who advocate a pushing north of white tribes, as Stefansson does, must know the truth of the life as a hardy white man actually lives it. Here is a picture in Peary's own words of a typical adventure in the 1899 trip.

THE NORTH POLE MEN

On the sixth of January, 1899, after a sledge journey in the very midnight of the great Arctic night, a journey over an unknown frozen track of such roughness as you can scarcely imagine, reduced to a diet of raw dog. I stumbled into Fort Conger, the abandoned headquarters of the Lady Franklin Bay expedition, with both feet frozen.

For six weeks I lay there on my back a helpless cripple, through the utter darkness, living principally on cornmeal and molasses, my companions trying to infuse a little warmth into the atmosphere by burning empty boxes and barrels, until the faint rays of returning daylight, in the latter part of February, permitted an attempt to reach my ship, two hundred and fifty miles to the south.

Lashed to a sledge, my feet wrapped in a musk-ox skin, I was carried on a journey made in 11 marches,

of from 12 to 18 hours each, bumping and pounding over the broken ice of the Arctic Sea. The mean minimum daily temperature during that march was $53\frac{1}{2}$ degrees below zero; the temperature on the day we reached the ship was 65 degrees below zero, or 97 degrees of frost.



BEAR CORNER IN FRANZ JOSEF LAND. WHERE NANSEN AND JACKSON MET



DR. KANE AND HIS COMRADES IN THEIR WINTER QUARTERS



PEARY AND HIS DOG FRIENDS ON THE FAMOUS MARCH TO THE NORTH POLE

Such experiences did not leave him unmarked, and this indomitable man marched to the Pole less some of his toes, which had been destroyed by frost-bite.

His many expeditions, always adding a little to knowledge, and carrying him step by step nearer his goal till he was actually within 200 miles of it in 1906, was a process of dogged reduction of dangers and distances, and it became difficult to secure consistent support for work which, while sound and valiant, had nothing of spectacular attraction for the investing patriot at home. Eventually a Peary Arctic Club of moneyed men was formed to finance him, and, with £10,000 from this source, he set out in July, 1908, for what proved the final and triumphant foray. His ship was the *Roosevelt*; the captain, a Newfoundlander, Robert Bartlett, the finest ice

master of his age; the crew under his command were all sons of Newfoundland.

The party, consisting of seven white men, 17 Eskimos, one Negro, with 19 sledges and 133 dogs, began its march in the middle of February, and did not get its first glimpse of the sun till March 5,

when a red disc appeared for a few seconds above the horizon. Till then the group had travelled in utter darkness.

In regular order the numbers of men and dogs were reduced, parties being successively sent back after depositing stores for the main party's return journey.

THE HERO WHO WENT BACK IN SIGHT OF HIS GREAT HOUR

The heroic Bartlett, who had handled the Roosevelt superbly through all her ice difficulties, bore the brunt of the expedition up to the 88th parallel. As a fact his work ended five miles short of that point, but he walked the extra five miles so that he might boast that he, with Peary, was the only white man in the world to reach that tremendous latitude. With one touch of imagination on the part of Peary, this fine Newfoundlander would have stood side by side with his leader at the Pole, but it was not to be. Peary took with him a Negro, and not the doughty Bartlett. Afterwards he paid Bartlett a fine compliment, saying that he had taken him so far, not only because of the splendid character of his services to the expedition by sea and land, "but because of the magnificent British record in Arctic work covering three centuries, so that it should be a British subject who could boast that, next to an American, he had been nearest to the Pole." In spite of this, however, it is a regrettable fact that Bartlett was sent back with the last supporting party.

THE WHITE MAN AND THE BLACK MAN WHO STOOD TOGETHER AT THE POLE

The man who made the final advance with Peary was Matthew Henson, a Negro; it was a white man and a black man who stood at the North Pole on April 6, 1909. The final marches were devoid of incident, five marches of 25 miles each, with three Eskimos, the Negro, and forty dogs. At the end of the fifth march a sudden break in the clouds, somewhere about noon on April 6, 1909, enabled Peary to fix his position as 89 degrees 57 minutes North. The Pole was within his grasp. After a short rest he and Matthew Henson went forward with one sledge with a double team of dogs. They went ten miles, and, another light breaking through the sky, Peary found that he had actually *walked past the Pole!*

He struck eastward for eight miles, took fresh observations, and found that he had again reached and crossed the Pole.

All was empty white waste, snow and ice. Five miles from the Pole there was a break in the ice, and Peary, taking a sounding, found that he was standing over water which his measuring line of 9000 feet could not fathom. The temperature (it was summer) was 33 degrees below zero.

So that here, at last, was the goal for which men had striven and suffered and died for 300 years; and all was silence, desolation, a lifeless ocean sheeted with ice, with no land for hundreds of miles.

The two men stood there for an hour, the American son of an English mother, and the son of a slave whose ancestors had been naked savages in Africa.

It would have seemed right if Bartlett had been there as the representative of the race which had done more than all the rest of the world together to pierce the barriers of that kingdom of terror, but there was a touch of dramatic fitness, of which Peary was probably unconscious, in the presence of his black servant.

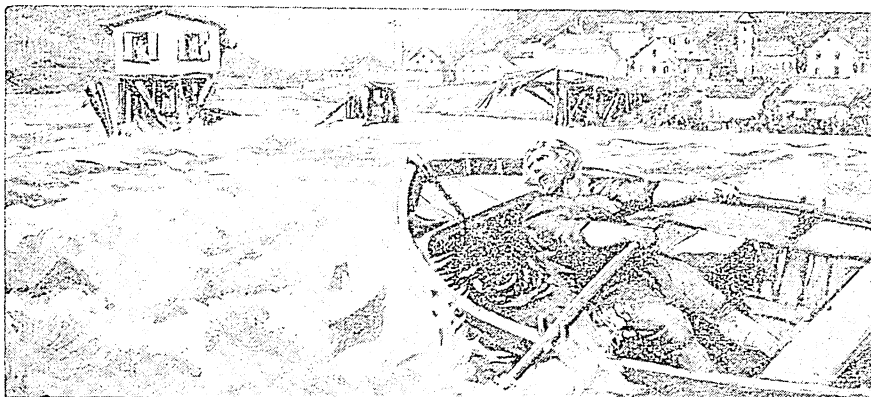
THE GREAT NEWS THAT REACHED THE WORLD BY WIRELESS

Princes, pirates, nobles, merchant adventurers, scientists, and many an old tough sea-dog had fought and suffered in vain to reach this place; and at last the glory of it was shared by a Negro. "He hath put down the mighty from their seat, and hath exalted them of low degree."

Peary reached the North Pole on April 6, 1909, and, returning to civilisation by rapid marches, he sent out his news by wireless from Indian Harbour, Labrador, so that the world knew the story early in the following September. At that moment there was on the high seas a man sailing in quest of the North Pole, who, hearing of the American's success, turned his ship about, sailed across the world, and discovered the South Pole instead. It was Amundsen the Norwegian.

When Peary came to England in May, 1910, one of the best little speeches, in which he was publicly acclaimed, was Captain Scott's. Scott spoke of himself as "one who has had some experience of Polar exploration, and hopes to extend it." Within two years he had reached the South Pole, where he lies. His gay gesture of ecstasy over Polar travel reads today like the cry of the gladiators as they entered the arena and bowed before the Emperor: *Hail, Caesar! We who are about to die salute thee!*

The Great Stories of the World That Will Be Told for Ever



THE PEASANT AT THE FLOOD

ABOUT a hundred years ago there were terrible floods in the neighbourhood of Verona, owing to heavy falls of snow in the Italian Alps, followed by a rapid thaw.

The rivers came dashing and roaring down from the mountain-sides, overflowing their banks and carrying everything before them. Among other disasters a bridge over the River Adige was carried away, all except the middle part, on which stood the house of the toll-gatherer, and he and his family were thus left completely isolated on a kind of timber island that might at any moment be swept away by the raging torrent.

The man, with his wife and children, appeared at the windows of their house, waving their arms frantically for help, and screaming to the onlookers in the distance to rescue them from their peril. But, though there were many on the banks who were anxious to help the stranded family, none had the courage to venture on the surging waters.

Then it was that Count Pulverini offered a reward of fifty pounds to anyone who would try to rescue the family. But no one willing to undertake the dangerous task could be found.

At this moment a peasant travelling from another part of the country came to the spot, and, seeing the very great

danger of the toll-keeper and his family, he immediately jumped into a boat and, taking the oars in his hands, began to pull toward the bridge-house.

But the current was terrific, and it was only by almost superhuman strength and effort that he was able, after a long time, to bring the boat alongside the broken piers of the bridge on which the house stood.

"Courage, my friends!" he shouted to the endangered family, and at last everyone was safely in the boat.

Then came the return journey, which was even more dangerous than the way out had been, for now the peasant had a boatload of passengers; but his strength was great, and his courage and determination were greater still, and at last he landed all safely on the banks.

The crowd broke out into a loud cheer, and the count came forward, holding out his purse by way of recompense; but the peasant, whose name has not come down to us, though his bravery and pure-hearted sacrifice will ever live in the annals of heroism, declined to accept the reward, saying:

"I should certainly not expose my life for money. I can work for all I need to meet the wants of my wife and children. Give the money to those who have lost all"

IMAGINATION · CHIVALRY · LEGENDS · GOLDEN DEEDS · FAIRY TALES

LA GRUE ET LE CRABE PRUDENT

This is a French translation of the story told in English on page 3251

UNE grue était devenue trop âgée et trop faible pour pouvoir s'emparer des poissons qui vivaient dans un lac proche de son nid. Aussi, après avoir réfléchi, elle résolut d'accomplir par la ruse ce qu'elle ne pouvait plus faire par la force, et, s'adressant à un crabe qui demeurait dans le lac, elle lui dit :

"Mon cher ami, qu'allez-vous donc faire, vous et tous les poissons ? Il va venir des hommes qui vont faire écouler toute l'eau du lac, jusqu'à la dernière goutte. Vous serez tous pris et massacrés !"

En apprenant cette terrible nouvelle, tous les poissons s'assemblèrent pour tâcher de découvrir un moyen d'éviter un sort si cruel.

"J'ai trouvé un moyen," dit la vieille rusée. "Il est vrai qu'il m'arrive parfois de manger l'un de vous ; mais je ne voudrais pas que vous périssez en masse, faute d'eau. A quoi cela me servirait-il ? Or, il y a justement un étang spacieux à quelques centaines de mètres d'ici. Permettez-moi de vous transporter, un à un, dans mon bec, jusqu'à ce refuge."

Les poissons persuadèrent à une vieille carpe d'aller avec la grue voir si vraiment l'étang existait. La grue la saisit délicatement dans son bec et lui montra l'étendue d'eau, puis la rendit saine et sauve à

ses compagnons, qui, en apprenant que l'étang était bien là, s'écrièrent tous :

"Très bien, Madame la Grue, emportez-nous tous."

La vieille rusée avait l'intention de prendre les poissons un à un dans son bec, et d'aller les manger sous un arbre, bien loin de l'étang ; par malheur elle commença par le crabe prudent.

"Viens donc," dit-elle au crabe, "que je t'emporte dans mon bec au nouvel étang."

"Je n'ai pas envie de me fier à ton bec," dit le crabe. "Tu pourrais me laisser tomber et briser ma carapace. Nous autres crabes, nous avons une fameuse étreinte. Laisse-moi me cramponner à ton cou, et tu m'emporteras ainsi."

La grue ne s'aperçut pas que le crabe cherchait à la surpasser en finesse, et elle consentit. Mais lorsque le crabe fut bien agrippé à son cou, au lieu de partir pour l'étang, elle se dirigea vers l'arbre.

"Où est l'étang ?" demanda le crabe.

"L'étang ?" dit la méchante vieille. "Est-ce que tu t'imagines que je me donne toute cette peine pour rien ? C'est tout bonnement une ruse pour vous attraper, toi et les autres poissons, un à un, et vous manger."

"Je m'en doutais," dit le crabe. Et il planta ses pinces dans le cou de la vieille grue et l'étrangla.

THE STEWARDESS OF THE STELLA

WHEN the steamship Stella left Southampton on the afternoon before Good Friday in the year 1899 she was bound for the Channel Islands, with nearly two hundred passengers on board.

Not long after the vessel had left the Solent a fog settled down on the sea ; but the captain hoped it would lift, and kept the ship at full speed. The holiday-makers were in high spirits, looking forward to meeting their friends.

But near the end of the trip the fog grew denser, and the Stella crashed on the rocks. The ship was doomed and began to sink.

The lifeboats were lowered, and in those terrible moments the unhappy people behaved as bravely as men and women can. But the name of one woman will always be remembered when men think of the sinking of the Stella. Mrs. Mary Rogers, the stewardess, comforted the women, and gave to each a life-belt,

fastening it with her own hands. She led them to the side of the sinking ship, where the boats were being lowered and the passengers carried from the wreck.

At the last moment it was found that one woman had no life-belt. Instantly the stewardess took off her own belt and gave it up, and the last of the women under her care was safely lifted into the boat. The sailors called to the stewardess to jump in, but the boat was already full.

"No, no !" she said, "there is no room ; one more would sink the boat."

The ship plunged down into the sea, and Mary Rogers looked on the world for the last time.

"Good-bye, good-bye !" she cried, and then, with uplifted hands, as though in prayer, "Lord, take me !"

In a minute the Stella was gone, and the memory of the brave stewardess had become one of the things that help to make us brave when trial comes.

THE LAND OF RED DAISIES

A FAIRY and a witch fell out about a magic ring, and they came to the young and handsome king of the country and asked him to decide to which of them the ring belonged.

The fairy said the witch had stolen it from her, and the witch said that she had bought it from a magician in the Land of Red Daisies.

The king looked at the ring, and, finding no name upon it, he handed it to the witch, and said :

"Let me see what enchantment you can work with it."

The witch rubbed the ring, and nothing wonderful happened.

The king then handed the ring to the fairy, and she kissed it and touched his silver throne with it, and the throne turned into pure gold.

"Rings belong to those who can use them," said the king, giving the ring to the fairy.

"And asses' heads belong to those who deserve them," said the witch, touching the king with her wand.

The courtiers gave a cry of horror. The king had become a man with an ass's head. But the fairy said to him :

"Love can cure the effects of hate. Marry at once a sweet and trustful wife, and the spell will soon be removed."

The king then commanded all the young girls in the country to assemble before his palace so that he might choose one of them to be his bride. He looked at each of them in turn, and each of them in turn started back in disgust at the sight of his ass's head, and he sadly dismissed them all.

As he was coming away he saw something moving behind a tree, and found there a pretty beggar-maid. Being barefooted and clothed in rags, she had been ashamed to stand among the other girls. The king looked at her, and, finding that her eyes were full of pity and love, he exclaimed : "You shall be my queen."

He appointed ten maids of honour to array her in beautiful robes and glittering jewels, and then he led her to the cathedral, where they were married.

"Now," he said, "do not seek to know anything about me until tomorrow morning, and then you shall know everything."

But in the night the young queen touched her husband's head and felt that he had a human face ; and she got up and lighted a candle and looked at him. Yes,

it was true ! The ass's head had disappeared, and he was a young and handsome man again. She made a movement of joy, and tipped up the candle. A drop of burning grease fell upon her husband's hand, and he awoke and said :

"Unhappy girl ! Tomorrow morning the spell would have been entirely removed. Now the witch has regained her power over me, and I must go and live with her in the Land of Red Daisies."

In a moment he was gone ; but the young queen felt that she could not live without him, and set out to find the Land of Red Daisies.

Outside the palace she met the fairy.

"Please show me the way to the Land of Red Daisies," said she.

"That is the place where the witch lives," said the fairy, "and I have never been there. But take my magic ring, and it will, perhaps, help you."

And so it did. The young queen had only to kiss it and touch a stone with it, and she obtained gold to buy food and lodging with. In this way she wandered to the end of the country and came to a hut on the edge of a great desert. In the hut was a little old woman, and the young queen said to her :

"Please show me the way to the Land of Red Daisies."

"I do not know where it is," said the little old woman, "but my pig often goes there and comes back laden with precious things. It departs suddenly, and I can never tell when it is about to go."

"Very well," said the young queen ; "I will sleep beside your pig, and wait until it sets out for the Land of Red Daisies, and then follow it."

She lay down in her beautiful robe in the straw beside the pig. In the middle of the night the pig shook itself and ran out, and she followed it, and came through the great desert into a strange, red land. The daisies were red and the leaves of the trees were red, and amid the trees stood a strange, red palace.

She tied the pig to a tree, and in the wood she met a ragged peasant girl, whom she persuaded to change clothes with her. Then she went to the red palace and was engaged as a maid.

"You must work very hard and help me to get the feast ready," said the cook. "Our mistress is a witch, and her daughter is about to marry the king of the country beyond the great desert."

"That is my husband," said the young queen to herself, and, going upstairs, she peeped into the room where he was sitting, and saw that it was so.

In the middle of the night she came to the room where he slept, and awakened him. He did not recognise her. But he remembered everything when she kissed the magic ring and touched him with it.

They crept softly downstairs and got out of the palace, and found the tree to which the pig was tied. The poor animal was very hungry, and as soon as it was released it started back home. They followed it in the moonlight, across the great desert, and came at break of day into their own country, where they lived together in peace and happiness.

THE BRAVE MAID OF THE MILL

IN a small village near Bonn, on the Rhine, there is a mill which, on a Sunday long ago, was left in charge of a servant-maid named Hänchen while the miller and his family went to church.

The youngest child, a boy of five, being too young to go, stayed with Hänchen.

Now, Hänchen was sought in marriage by a worthless fellow called Botteler; but Hänchen did not believe the bad tales about him, and on this Sunday morning, when he knocked at the door, she let him in and gave him food.

He dropped his knife, and when the girl stooped to pick it up, gripped her by the neck and threatened to stab her if she did not tell where her master's money was. In a moment she knew his real character; but, instead of yielding to fear, her courage rose.

She could hardly speak, but managed to make him understand that she would yield to his wish, as she had no choice. Then she led the way to her master's bedroom and the box where he kept his money. Putting an axe in his hand for him to open it with, she said she would hurry upstairs and collect some clothes and her money, for she dared not stay after betraying her master.

But Hänchen returned to her master's room another way and bolted the robber in. Then she ran downstairs and out at the front door to find help. She saw the little boy, and told him to run to meet his father, and say that he must come quickly or something dreadful would happen. The little fellow, young as he was, understood, and ran off at her bidding. Suddenly, however, she heard a whistle, looked up, and saw her prisoner signalling to someone to catch the child. Then, to her horror, as the little fellow ran on, she saw a man spring up from the ground, snatch up the child, and run back toward the mill.

Hänchen at once recovered her presence of mind. She must save the child now as well as herself and the mill. She went

back hastily into the mill, locked and bolted the door.

Soon the man who had snatched up the child clamoured to be let in. He threatened the screaming boy with a knife, and said he would break down the door. But Hänchen trusted in God.

Then the man Botteler called to his accomplice to kill the child. Poor Hänchen shuddered at that; but she reasoned that the child's death could be no gain to them, and rightly judged this to be a mere threat. Then the robber outside threatened to burn down the mill, and put down the child to go and carry out his threat. In peering round the mill he found the big hole where the wheel was; so he returned to bind the child with a piece of rope, and went back to creep into the mill that way.

Meanwhile, Hänchen thought that if she set the sails of the mill in motion the neighbours in the country round would know that something was wrong. She had seen the machinery worked, so she flew to the engine and set it going. Slowly at first, then faster and faster it went, but she little knew that the robber had squeezed himself into the drum-wheel. There he was, whirling round and round, unable to stop the machinery, and there he whirled until he grew senseless.

But, although she had heard his cries, Hänchen dared not let him out of his terrible prison, and she knew he would not be killed. Then the brave girl waited and waited, till it seemed as though her master were never coming.

But he came at last, and with him were neighbours who had come to find out why the mill was working. Hänchen managed to tell them, and then she fainted.

They secured the two robbers, and both were bound and taken to Bonn. There they were punished for their evil deeds. But the miller's eldest son married the brave Hänchen, and she lived all her life in the mill which her wits had saved from destruction.

Nature's Wonderful Living Family in Earth and Air and Sea



A swarm of locusts in Algeria

INSECT FRIENDS AND FOES

SERIOUS thinkers have gravely asked whether the last and greatest of man's fights for the mastery of the Earth has not yet to come, and whether he will win.

We have beaten all the great beasts of the forest, the jungle, and the plain. We gain steadily against the strongholds of the venomous reptiles, even though snakes in India still destroy 20,000 lives a year. But the insects remain unsubdued, perhaps more terrible than ever before.

They affect us in more than one way. They kill us by rapidly fatal disease; they weaken us and make us ill. They devour our crops, they ruin our waning timber supplies; they incapacitate and kill the cattle and other animals on which we still rely for food and labour. They are closely related to our lives and affairs in ways we little think of.

The world never has quite enough wool for its needs, never quite enough meat to furnish poor men's tables cheaply. Does it ever occur to the Yorkshire king of the woollen manufactures, or to the man who makes strings for violins, to the man who makes parchment, or to those who furnish us with mutton and lamb, to say nothing of the indispensable medicines from the sheep which go to the chemist's laboratory, that their industries are

dependent on the unconscious exertions of two kinds of transported bees?

New Zealand, farthest from the heart of the British Empire, is the greatest single source of British foodstuffs, of dairy produce, of mutton and lamb, and second only to great Australia in point of wool. Think of that, and then ponder the conditions of less than 100 years ago. The early colonists naturally wanted cattle, horses, and sheep about them, but native growths furnished no suitable fodder, and unless such munitions of life were carried year by year across the world there could be no herds, no flocks.

As we could not find ships to maintain a stream of fodder to the other side of the world, we sent white clover to New Zealand. Alas, though it grew luxuriantly in the first year, it died down without seeding. There were no insects in the land to fertilise it, so we sent the honey-bee to New Zealand, in a memorable year, 1842. Since then the England of the Pacific has never lacked white clover. But white clover did not suffice; the fine red clover was needed. That, too, was sent, but also in vain. Red clover, like white, would not set its seed in a bee-less land. Then it was that some despised entomologist, who knew the secret of red

clover and the way of a humble-bee, sent a cargo of humble-bees from Old England to New Zealand, and from that time forth there has been no failure of clover, nor of beef and mutton, leather and wool, butter and cheese.

Wool is the Golden Fleece of Australasia, and it is founded on bee labour. The wonderful fruits of the same continent, the peaches, apricots, nectarines, pears, and apples, are a direct gift from the same insects, without which these trees cannot be fertilised, cannot yield fruit.

THE BRITISH BEES WHICH BROUGHT PROSPERITY TO JAPAN

Japan has fruit enough for her own population, and a growing surplus with which to swell the food supply of the outside world. She owes it to our exported bees, for though Japan had bees of her own they were less industrious than British bees. They gathered honey sufficient for the hour and no more. They visited few blossoms; Japanese fruit trees remained largely unfertilised, and such fruits as they grew were small, poor in quality, and devoid of sweetness. We sent Japan our bees, and these marvellous little alchemists have made her a land flowing with honey and sweetness.

A British bee desires to live beyond the morrow, it accumulates stores to outlast the winter, and so slaves throughout the summer, the very embodiment of energy, visiting not only clover but fruit trees, and giving man fruits of value and beauty which no other agency could contrive.

The subject goes very deep. We have seen that mites living as parasites on bees, choke the breathing tubes of the honey-makers, and are as fatal to a national stock as plague is to a human community. But are all mites as pestilent as that? What of the mite which attaches itself to the house-fly? Are these as harmful to the fly as their cousins to the bee? If so, then we should encourage the fly's parasite and get rid of the fly. That is a problem the entomologist has to solve.

THE BAD DAY FOR MAMMALS WHEN THE TICKS CHANGED THEIR HABITS

We never can say without prolonged experiment whether parasites in habit may not transfer their attentions from one form of host to another. Practically all the mites and ticks, sources of immense suffering and damage to ourselves and our animals, are by nature intended to suck the juices of plants; yet they have turned

to mammalian blood and become one of the chief scourges of the Earth.

Science has yet to find out how natural laws work with parasites and particular species. There are, for example, two of the most dreaded creatures in the world in the cotton boll worm and the cotton boll weevil, the insects which threaten the cotton crop of America.

A voracious feeder on the cotton plant, the boll worm is a vicious cannibal, and two of the same species seem unable to meet without trying to devour each other. Sometimes one succeeds; where the two are equally matched they usually inflict such mutual injuries that both die. If some wizard like Luther Burbank could evolve a race of such creatures, entirely carnivorous, and stronger than the half-vegetarian cannibals, the problem might be solved. Egypt has mastered a similar peril to her cotton by preserving the egret in her cotton fields.

But worse than the work of this worm is the work of the cotton boll weevil, of which we read on page 2562. This weevil is a horny-coated beetle, and is well protected by its resemblance to the colour scheme of its surroundings.

THE LITTLE ALLIES OF MAN IN HIS FIGHT AGAINST THE BOLL WEEVIL

Human devices seem powerless against it, but men can summon aid from the natural enemies of the little wretch. Of these there are nearly 30 insect forms which live as parasites on the weevil, among them four species of mites, some bugs, some beetles and ants, some flies, and, most astonishing of all, a caterpillar, all devouring either the eggs, the larvae, or the adult cotton boll weevil.

We need not enter minutely into the list, but the point of interest is the development of this change of habit and diet by insects.

The caterpillar, which is an enemy to the cotton boll weevil, and therefore a friend to man, is a convicted poacher, not perhaps a converted thief. American farmers call it the cotton-leaf worm. Before the weevils winged their way from the wild cotton of Mexico, these caterpillars were an unredeemed pest, consuming the cotton plant as the caterpillar of our white butterflies consumes our cabbages. Fortunes were spent in battling with this grub before the weevil came, and then the enemy became the

INSECT FRIENDS AND FOES

ally. The very damage the leaf-worm did in stripping the foliage denied the weevil and its offspring protection from the sun, so that the plant became a death-trap to the weevil.

Wonderful to relate, however, the moth's caterpillar became converted to a partial animal diet. It turned on the buds in which the grubs of the weevils were housed, and ate buds, larvae, and all; and it has happened, therefore, that this larva, which was one of the most dreaded creatures in the cotton country, has become a sort of partner in the cotton grower's fortune. We cannot say, however, to what extent it may become valuable in fighting the deadly pest.

A SOUTH AFRICAN SPECTACLE WHICH BRINGS BIBLE DAYS TO MIND

There are parasitic agencies in the locust world, but we do not know how to foster and strengthen the parasites against the terrible enemy of mankind. Perhaps a locust has no greater enemy than another locust, for the young locusts eat other young ones, and the adults, when food grows short, become ferocious cannibals.

Perhaps man himself may prove the great parasite here, as in so many other directions. In Australia he is coining into gold the rabbits which have taken such toll of his prosperity through the three or four generations which have passed since their introduction into that great land, and there is a hint that the locust may now be utilised in similar fashion.

For there was a dramatic conjunction of events during the summer of 1924. By proclamation of the South African Government a July day was observed throughout the Union as a day of prayer and humiliation, in consequence of drought and a widespread plague of locusts. The Governor, the Prime Minister, and the Cabinet attended a service of supplication. It was a moving spectacle, carrying the mind in a flash back to Bible days.

THE PROFIT THAT MAY COME FROM THE PLAGUE OF OTHER DAYS

And then the other side of the medal, an absurd contrast, was this—that consignments of locusts were arriving in Holland from Johannesburg to feed cattle and poultry, and to provide oil for aeroplane engines. We search the seas for dolphins because in their mouths is an oil incomparable for the fine works of our best watches; we crush the locust and express its oil because it has unique

properties enabling it to retain liquid form when exposed to the intense cold of the heights to which aeroplanes fly.

There is an astounding contrast; a present cause of woe and poverty which may in time become a rich asset, a plague from the dawn of civilisation in hot lands may add at last to the prosperity and well-being of mankind. In the event of the experiment being successful, the locust might actually become a source of profit.

With such a contingency in mind, our sense of gratitude to the Cantharides beetles may be a little lessened, though some of the 1500 species are notable devourers of locust eggs. Americans speak of grasshoppers when they mean locusts, and so mask the fact that they have there terrible swarms of these ancient and relentless enemies of mankind.

That being so, they should be specially grateful to certain blister beetles of the Cantharides group. The mother beetle lays her eggs near the spot in which a mother locust has deposited her packet of eggs. When the young beetles hatch it is their task to search out and find the buried treasure of locust eggs, to bore down to them, to pierce a way into the egg-pod, and there to dine and sleep, sleep and dine, until the time arrives for a new skin, and for the opening move in one of the most astonishing series of changes of form—six in all, known to science.

SIR FRANCIS DRAKE'S GOOD JOKE ABOUT THE SPANISH FLY

We call this creature the Spanish fly, and from its body the chemist derives a substance so acutely irritant that, applied to the flesh of human beings, it raises blisters. That is known as a counter-irritant, and is used to relieve deep-seated congestion, and to draw out inflammation. It is applied to the backs of the legs of horses whose tendons have been strained by too much heavy hauling.

There can never be any difficulty in remembering the name of this beneficial insect, for it forms the subject of a famous joke attributed, without historical foundation we fear, to Sir Francis Drake.

The legend runs that when he fought and beat the Armada, and saw the broken fleet fleeing before him in terrified disorder, he sent a jubilant despatch to Queen Elizabeth consisting of one word, "Cantharides," by which he meant, of course, *The Spanish Fly*.

We have looked at some examples of one class of insects attacking either the eggs, larvae, or adult forms of other kinds of insects, to the great advantage of man. Another instance is afforded by the Calosoma beetle, which waxes fat on the eggs of the gipsy-moth, a creature whose record of devastation is discussed elsewhere.

But, leaving these aspects of hostility between different classes of insects for a moment, let us revert to the scheme of policing ordained by Nature within one family. That takes us back to the great bug family and brings us to what is popularly known as the fly-bug.

THE FRIENDLY INSECT THAT DESTROYS INSECT ENEMIES IN OUR HOMES

It is a true bug of extraordinary habits. Four-winged and a great flyer, it enters human habitations by night when the lights are up, and makes ordinary bugs its prey, though other insects injurious to us are included in its menu. The larvae of this creature may develop in our houses, in out-buildings, or even in the bark of trees. Whatever their home, they have the extraordinary habit of concealing themselves by enveloping their forms in the fine debris amid which they move.

That insect is a fly only in name, but we may pass to flies which are a reality, and recognise that we have to wage a war across the world against flies which make direct attacks on our persons and are incredibly hurtful to our pockets. How is that war to be waged?

We have given Australia every mammal she possesses, except the Merino sheep. We have given her plagues among her possessions. The horrid blow-flies from the Motherland have also made the long voyage there, some as adults in ships, some as larvae in stores. For long these blow-flies confined their attentions to the flesh of slaughtered animals, to carrion, and the rest; but then an astonishing thing happened.

THE INSECT THAT COSTS AN AUSTRALIAN STATE £1,000,000 A YEAR

In New Zealand a parrot called the Kea turned ravenous traitor and started killing the sheep in pasture and fold by tearing open their backs with its cruel beak; and the blow-flies have now turned on the Australian sheep with results no less deadly. They settle on the wool, they produce live grubs which burrow down to the flesh and devour it.

When we learn that damage amounting to a million pounds for a single Australian State, and to three times that figure for the whole continent, results in one year from the practices of these flies, we remember what old Linnaeus said—that three flies will destroy a carcass as surely as a lion can devour it.

Australian sheep farmers, whose all is in their flocks, were driven almost to despair by this new catastrophe which threatened to become chronic; but a natural ally was unexpectedly found in one of the Chalcid flies, a native which, turning from a former diet, quite unlike, devoted itself to the consumption of blow-fly larvae. It proves that this fly can be artificially stimulated to enormous productivity, yet the Commonwealth Government were not satisfied with one species.

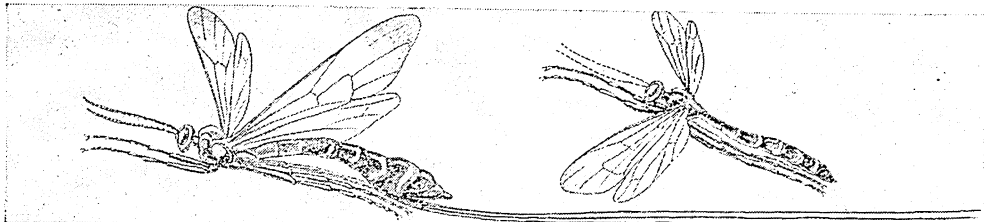
Professor Maxwell Lefroy, of the Imperial College of Science, was sent from London to Australia during the war to do battle with insects which were destroying the grain accumulated there for us, but which could not be delivered owing to submarines and shortage of shipping. The Australian Government asked him for a remedy against the blow-flies which we had had the misfortune to send to the Antipodes. After his return to England, the professor worked industriously at the subject in his South Kensington laboratory, and was able to furnish an opening list of insects fatal to blow-flies.

THE ENGLISH FRIENDS OF THE AUSTRALIAN SHEEP FARMERS

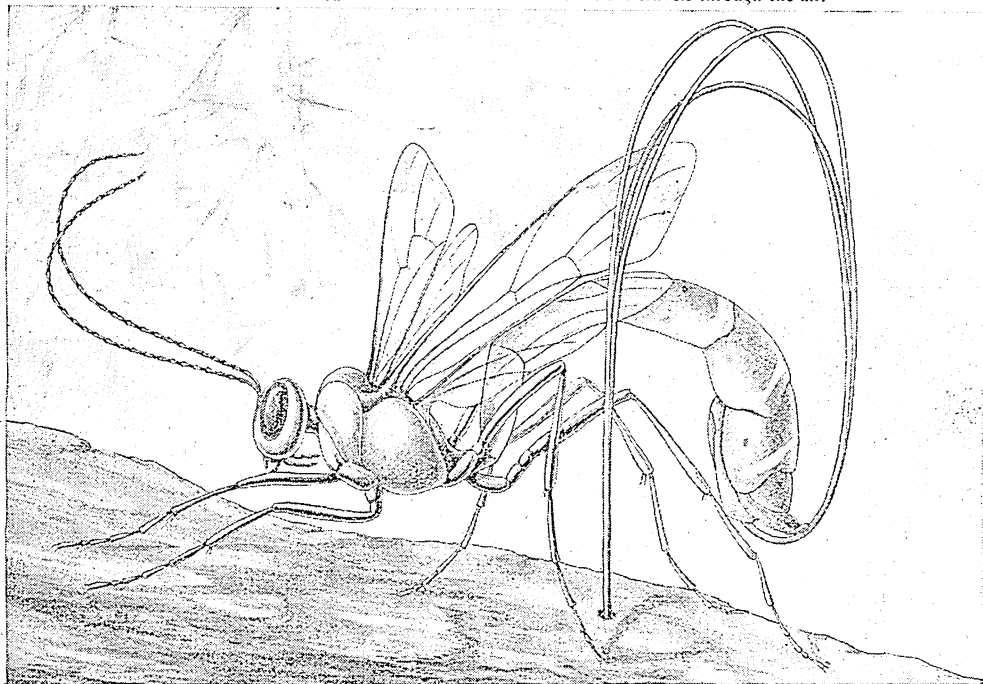
There is what we call the *Alysia manducator*, which searches out the blow-fly larva and lays an egg in its body to hatch and devour the offending maggot. There is a powerful and audacious yellow-fly often seen about our meadows, following in the footsteps of cattle, which attacks the blow-fly, seizes it at the back of the neck, and sucks its juices like a spider, but does not assail man or his animals. There is the *Hydrotæa dentipes*, whose larva lies down with the blow-fly larva and eats it, but does not attack a healthy sheep.

All these insects we can send from England. We can send the eggs in cold storage; we can hatch the grubs, pack them in earth, and send them as first-class passengers in the ship's cool chambers. We can send them to Australia, to South Africa, to the Argentine, or anywhere in the world where blow-flies are attacking the inoffensive sheep. It is

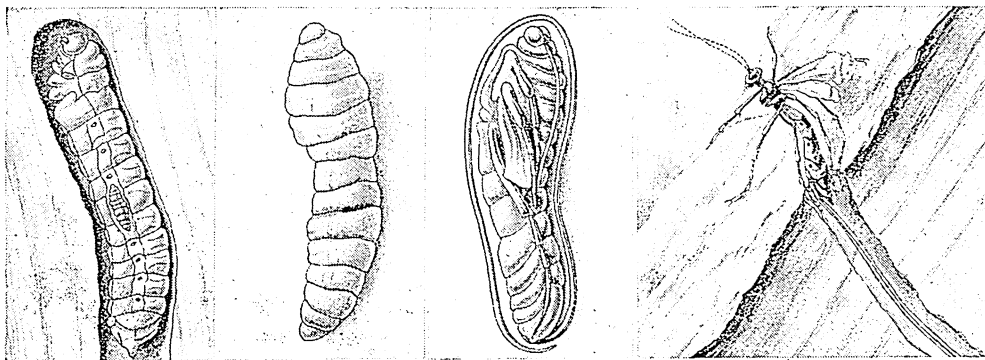
FRIENDS AND FOES AMONG INSECTS



1. One of the strangest of the ichneumon flies is the thalessa, shown in this picture. On the right is a male and on the left a female. Both insects are flying, and it will be noticed that the female has an enormously long ovipositor for depositing her eggs, which trails out behind her as she travels through the air.



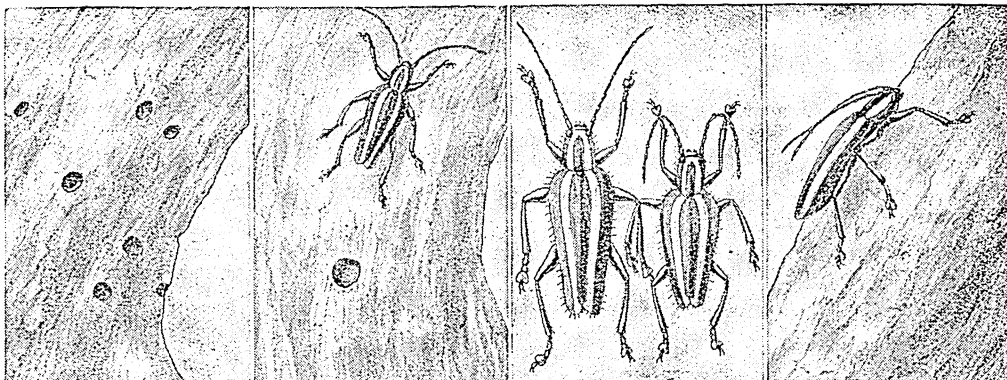
2. This insect is a parasite living on the larvae of certain wood-boring insects, principally the horntail or tremex. The thalessa bores deeply into wood and lays an egg near the place where the tremex has already laid her egg. To see the female thalessa laying her egg is one of the most interesting sights an entomologist can have. The thalessa curves her ovipositor, which is divided, right over her back and brings it forward to bore the hole and lay the egg, as shown here.



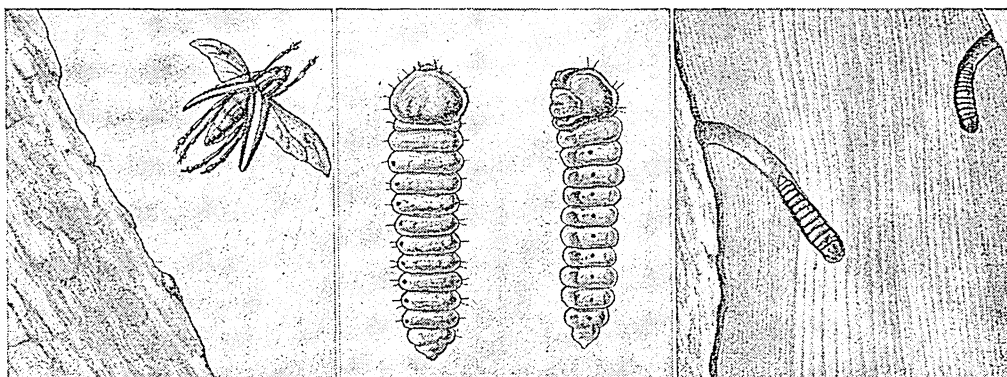
3. When the little ichneumon larva hatches out it attaches itself to the larger tremex larva, and begins to feed on it.
 4. This shows a magnified view of the thalessa larva, when grown to full size and ready to change into a pupa.
 5. In the pupa the long ovipositor is curled carefully round the body ready to be unfolded at the proper time.
 6. At last the perfect insect emerges. It makes its way out of the timber where it was born, opens its wings, and flies off in the way shown in the first picture to repeat the strange life-story.

THE REMARKABLE LIFE-STORY OF A FRIENDLY ICHNEUMON FLY

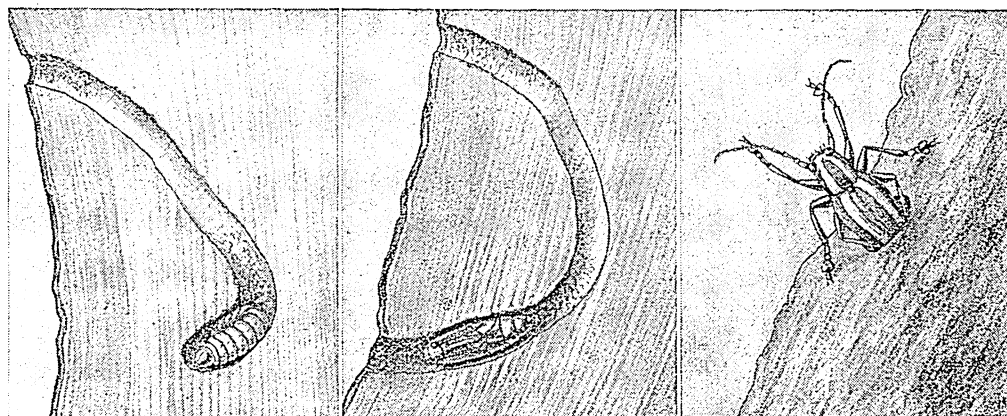
THE ENEMY OF THE APPLE TREE



1. In America the apple trees in an orchard are often found dying, with little round holes about as big as a lead pencil in their trunks, near the base.
2. From the holes, if we watched, we should see a rather handsome-looking insect, about three-quarters of an inch long, emerge and crawl up the trunk.
3. This insect is a beetle, brown with two white stripes, and is known as the apple-tree borer. The female shown on the left is larger than the male on the right.
4. The beetles emerge from late May to the middle of July, and the female soon begins to lay eggs. She first nibbles a little pocket in the bark for the egg.

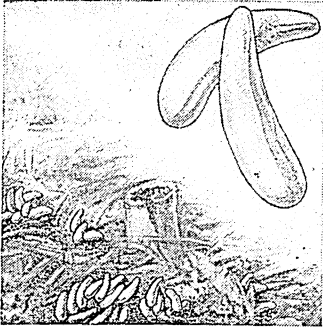


5. The egg is then laid in the pocket and pushed under the bark. It is oval and brown, and is covered with a gummy substance. Here the insect is flying away after laying the egg.
6. In two or three weeks the egg hatches out into a pale yellow grub, and this at once begins tunnelling under the bark in the sap-wood. The grub is here shown magnified.
7. The grub goes on tunnelling for a year or two, remaining dormant each winter, but working farther into the wood from March to late autumn. The full-grown grub is an inch long.

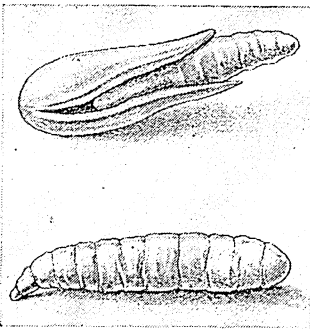


8. It often cuts clean across the tree, and several grubs at work in one tree will riddle it. In the third summer the grub finally extends its burrow outward to the bark of the apple tree, packing it full of sawdust and woolly fibre.
9. Near the end of the tunnel a small chamber is left, both ends being plugged with sawdust, and there, after hibernation, the grub sheds its skin and changes into a pupa, yellowish at first but darker later.
10. In about three weeks the adult beetle emerges, as shown in the second picture, to begin its work over again. This insect is probably the most destructive of all pests that attack the apple tree. No remedy is known.

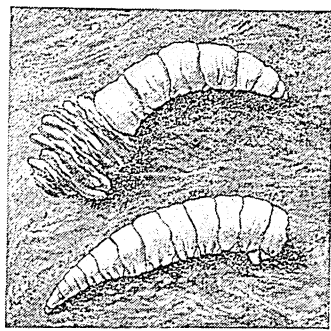
THE STORY OF THE TERRIBLE HOUSE-FLY



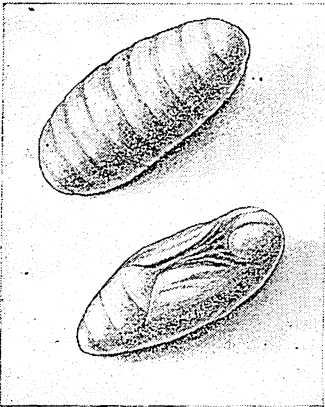
1. Here is the story of a house-fly, one of the worst foes of man. After sleeping through the winter the fly wakes up in spring and lays hundreds of oval white eggs in any filth lying about. Two eggs are here shown magnified.



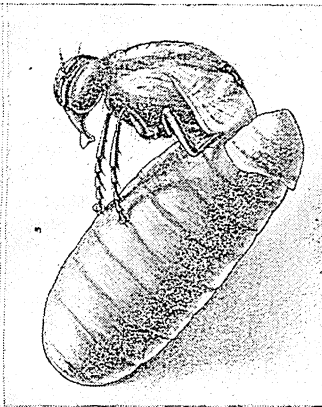
2. During warm weather the eggs hatch out in from eight to 24 hours. Each egg splits, and a white, legless grub, tapering in shape from the small pointed head to the blunt extremity, emerges and at once burrows into the filth.



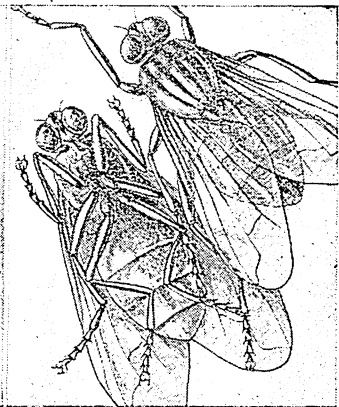
3. It grows rapidly, and as it gets bigger it twice casts off its skin and makes a new and larger one. It remains white during its growth until the last stage, when it often becomes yellowish. After about five days it becomes full-grown.



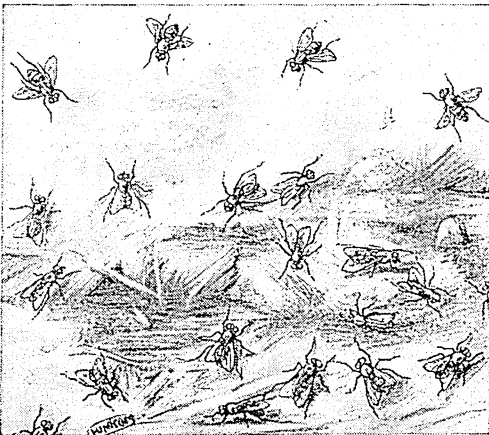
4. The grub now crawls to a drier place. After a rest its body contracts and becomes cylindrical, changing to dark brown. The larval skin becomes a pupa case and the larva a pupa. Above is the case, and below the pupa.



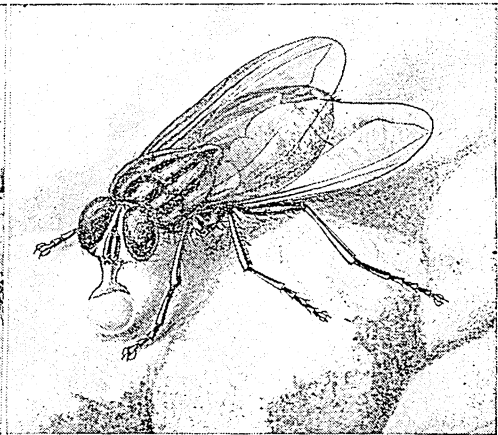
5. If the weather is warm the fly comes out of the case on the third or fourth day, pushing off the top, as shown here, and slowly levering itself out, with its wings loose and crumpled. It then crawls to the surface and its wings dry.



6. This picture shows the upper and under surfaces of the fly when it has attained its final form. In from ten to fourteen days after emerging from the pupa it is mature and able to lay eggs. It never grows after becoming a fly.



7. The fly now visits all kinds of filth and rubbish, much of which adheres to its hairy legs, and then it flies into a room and crawls over the food, depositing millions of germs that cause disease, especially in children. One fly may carry seven million bacteria and deposit 700,000 at every footprint.



8. The fly has also a nasty habit of swallowing its food over and over again, and this leaves a dirty spot on the sugar or other substance where the fly was standing. Each spot contains thousands of evil bacteria which may cause illness. The fly causes thousands of deaths every year.

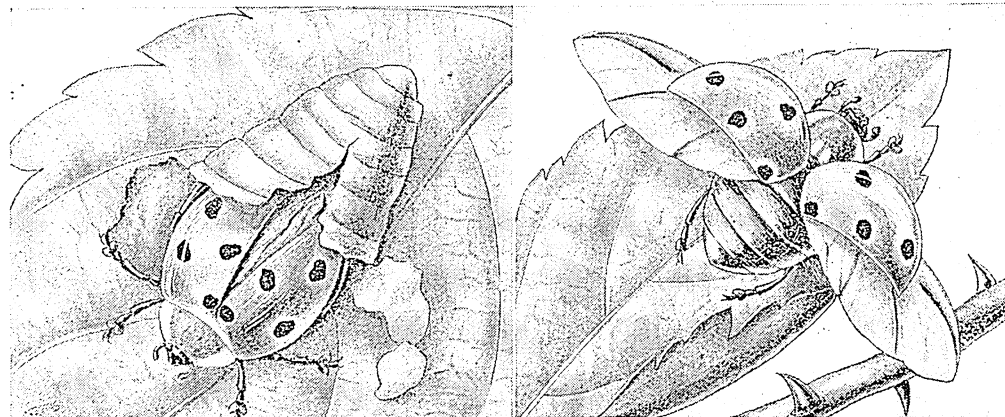
THE LIFE-STORY OF THE LADY-BIRD



1. During the winter the lady-bird, shown here, hides away in some obscure place and there sleeps through the cold weather, but in spring she comes out into the open once more.
2. She visits some place where her young are likely to find plenty of suitable food, such, for instance, as a rosebush visited by green-fly, and there lays a number of eggs.
3. Very soon the young hatch out into little slaty-grey larvae, looking, when seen through a magnifying glass, something like miniature alligators with six legs, as shown here.

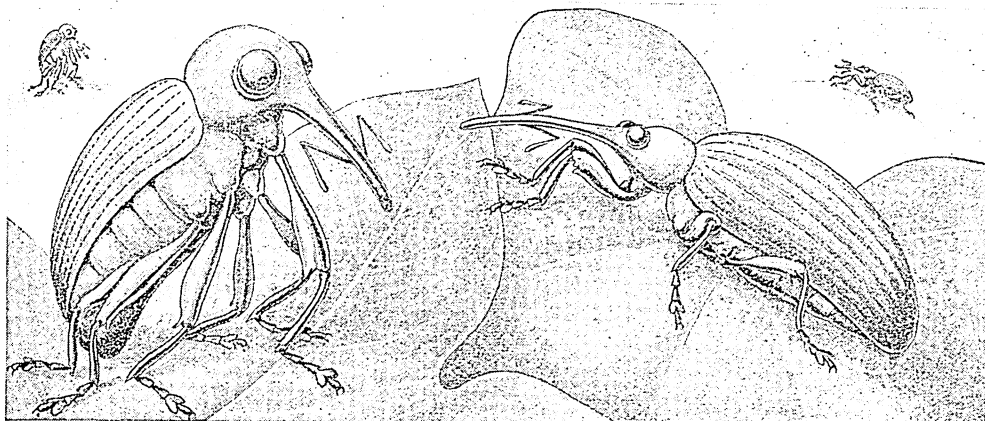


4. The larvae feed voraciously on the green-fly, devouring large numbers, so that a swarm of lady-bird larvae will soon clear an infested bush.
5. Birds would prey on the larvae, but they scare off would-be enemies by exuding an evil-smelling fluid from the joints of their legs.
6. When, after two weeks, the larva is full grown it attaches itself by the end of its body to a leaf or twig, and becomes a shiny black-and-orange pupa.

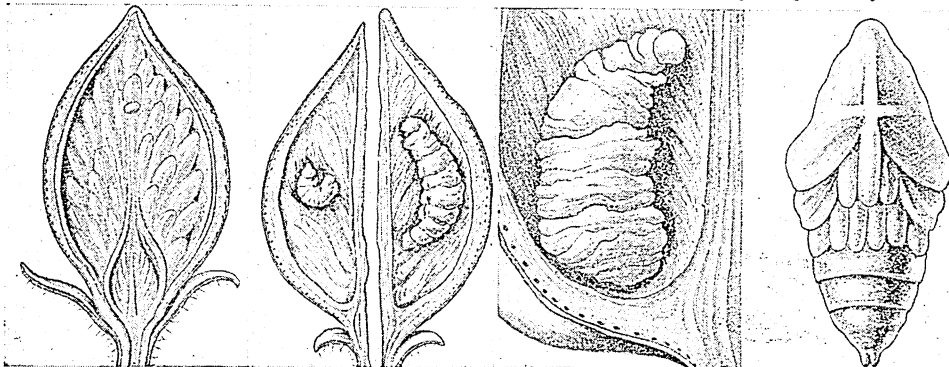


7. About a fortnight later the perfect lady-bird, which is really a beetle, with its black-spotted orange or scarlet coat, emerges from the pupa, and also feeds on the green-fly.
8. The lady-bird flies from leaf to leaf, and from plant to plant, by means of gauzy wings which, when it is resting, are kept folded away carefully under its gaudy wing-cases.

THE LIFE-STORY OF THE COTTON BOLL WEEVIL



1. In spring a little brownish beetle appears on the cotton plants in America, having just awakened from its winter sleep, and begins to feed on the leaves of the plant. Here we see it in two positions, natural size, and greatly magnified. It is one of the worst enemies of man, and is ruining America's cotton-growing industry.

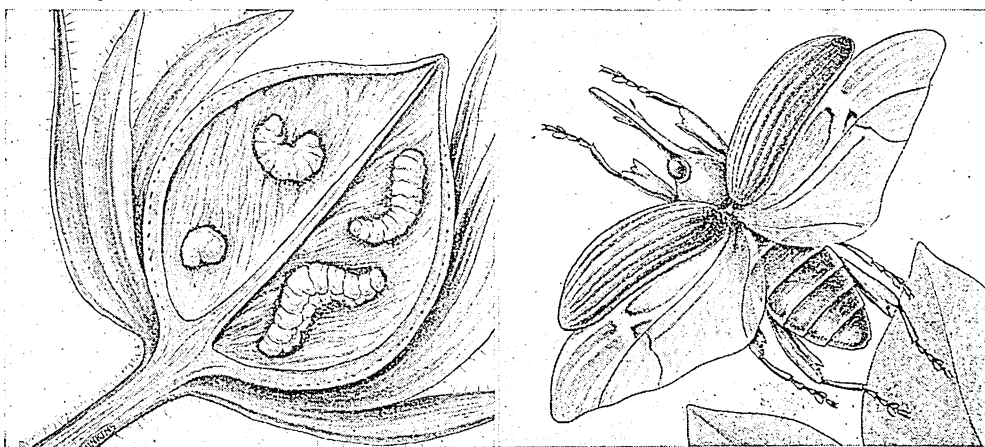


2. When the buds form, it bores a hole and lays an oval, pearly-white egg inside, as shown here, visiting bud after bud, and laying four or five eggs each day.

3. In three days the egg hatches out into a tiny white larva, or grub, with a brown head, and this feeds on the bud and grows larger and larger.

4. The grub, as it grows, changes its skin three times, and its castings form a case, shown here considerably magnified, inside which it changes to a pupa.

5. Here is the pupa, and in four or five days the case splits open and the adult beetle, or weevil, comes out and goes off to repeat the life-story of its parent.



6. Each female lays about 740 eggs, and when the bolls, or seed cases, containing the cotton are formed, eggs are laid in these, the larvae feeding on the cotton and ruining the boll. In twenty weeks the possible offspring of a pair of weevils reaches the amazing total of 12,755,100.

7. With the first frosts of autumn many adult weevils die, but others fly off to hibernate in hedges, woods, corn-stacks, and farm buildings, under the grass, or in empty cotton burs. In spring they wake up, come out, and begin again the story told in the first picture.

possible to do it on mass production lines, but we do not. . . We must move cautiously, for we never can predict what course a parasite, introduced into a new country, may ultimately follow. New Zealand farms and fields are suffering from insect pests because dragon-flies, which should eat them, are being devoured wholesale by trout in the rivers to which we sent them from England.

Still there are great successes to accompany potential triumphs, and it is to be supposed that anyone, farmer or gardener, whose crops, vegetables, or flowers are afflicted by the hateful green-fly, would bestow his blessing, if not more material recognition, on any institution which would enrich his botanical possessions with an additional stock of lacewing flies.

THE STRANGE HABITS OF THE LARVAE OF THE LACEWING FLY

They lay their eggs wherever green-fly abound, and very curious those eggs are. Each one is raised on a slender but strong stalk like rigid silk, spun from the mother fly's body. The larvae hatch quickly in early summer, and, looking rather like the young of lady-birds, and behaving similarly in their attacks on the green enemy, feast enormously for our good and their own.

Some of them have the extraordinary habit of slipping into the skins of the green-flies which they have sucked dry; some clothe themselves in any extraneous material to which they can gain access.

The ant-lion, which, unlike the lacewing, is not a native of our land, might also be another ally, but as all is grist that comes to his mill, and he may destroy our friends with our foes, we must not wholly rely on him for consistent service. Still, he appeals to our sense of the marvellous, and none of us goes to southern Europe without cherishing the hope of finding one.

HOW THE ANT-LION LIES IN WAIT IN ITS LITTLE PIT OF DEATH

In the perfect condition the ant-lion becomes almost indistinguishable from a lesser dragon-fly, but in the larval condition he is like an ant, with jaws like a giant's. But it is not there that the wonder resides; it is in his habits. He makes his home in a dry position in fine sand, and in this he excavates a pit. He begins by excavating a circle out of which he casts the sand by means of his powerful head. That done, he makes a second and a third circle, one within the other, so that by the time the last is finished he has one

continuous pitfall, two or three inches deep, spread before the feet of unwary crawling insects. Then he lies in wait; his body hidden in the sand at the bottom of the pit, only his jaws protruding. Along comes an ant or other insect. Inquisitive, perhaps incautious, it peers over the edge of the pit, and slips. The light sand is dislodged by its feet, and down sand and insect go together.

It may seek to escape, but there is no escape from the dungeon of this little Giant Grin. The moment the sand begins to topple, the ant-lion jerks up more. Some observers hold that the insect deliberately throws the sand at its victim in order to unbalance and confuse it in its struggle to return up the slippery slope. We do not know. Be it accident or design, the ant-lion does bombard his victim, does bring him down, and does fix his terrible jaws in him. The grip must be the counterpart in the insect world of the grip of an alligator's jaws on a man whom it holds down till he is dead in the water. Indeed, it is more than that. For, once the ant-lion's jaws make their snap and close, they never relax for a moment till the victim is drained dry.

THE PERIL THAT THREATENED THE ORCHARDS OF CALIFORNIA

On the whole, perhaps, we may give the ant-lion credit for helping us, and so add him to our list of friendly insects. Our catalogue would be enormous if we were to enumerate all the Ichneumon flies which are parasitic on other insects; but we have dealt with those elsewhere. They are of unquestionable aid to man.

We have touched elsewhere on the Chalcid flies, which are dealt with on page 1940, where the insect which fertilises the Smyrna fig is called a little wasp.

Perhaps the greatest romance of all our friendly insects remains to be told. America has obtained the bulk of its fruit stocks from the Old World, in exchange for the rubber, potato, maize, tobacco, and quinine which she had in readiness for the whole human family when Columbus discovered her. A few years ago California's stock of orange trees was recruited by supplies obtained from Australia.

It happened that scale, the outward and visible evidence of the presence of a deadly parasite, appeared on the trees, and spread from the oranges to the lemons, and to other fruit. It marched across the land, as plagues do march, with terrifying

INSECT FRIENDS AND FOES

rapidity, and for a time it appeared as if the orchards of California were doomed.

Once more the farmers, seeing their crops vanishing down the throats of multitudinous insects, turned to the scientist, who found that, though the scale was in Australia, too, it was there kept back without difficulty, simply because lady-birds dined, day in and day out, on the scale-producing insects.

THE LADY-BIRDS THAT SAVED THE ORANGE GROVES FROM DESTRUCTION

After many attempts a cargo of lady-birds was brought from Australia to America and the welcome immigrants were given their liberty on the orange trees of a scale-infested orchard. The newcomers settled down to a meal of scale insects. They flourished and multiplied, and were housed and preserved during the winter as carefully as so much refined gold, so that they could be distributed about the State where necessity demanded their presence.

From that time forth the collection and conserving of lady-birds has been a great business in North America. Each winter men are sent out to places where lady-birds are known to have harboured and fed in the summer, and where they hibernate in masses together.

Experts go to the snowdrifts in lady-bird country, dig down into the snow, and find great balls of inert life, gathered about a nucleus of pine-needles and what not. They collect countless masses of lady-birds in these winter hunts, store them in boxes, take them in cold storage to headquarters, and keep them at a temperature below freezing-point for the rest of the winter.

When spring and warmth come back to the land, and plagues of scale, green-fly, and soft-bodied parasites of a larger kind are reported, an army of lady-birds is packed into crates and sent to the endangered area.

THE LADY-BIRD AS A WORKING ALLY OF THE BEE

So the lady-birds wake up thousands of miles from the place where they went to sleep; so these little creatures have taken service, against their will and knowledge, with the lord of the Earth. They have come to possess an importance ranking them as worthy allies of the bee, the silk moth, and the lac insects. Ours will be a cleaner and greener land when we, too, have the good sense and initiative to inaugurate lady-bird armies on English rose gardens and our corn-fields.

We have paid tribute to the bee as a sovereign helper of man; let us be as mindful of the immense debt we owe to the silk moth. We cannot hope to estimate the money value of the bee to the world, but we do know that the price of the silk produced each year by the silkworm was 70 million pounds sterling before the war.

The silkworm is the most astonishing of man's minor conquests. It is more intimately linked with human life than any other living thing we have, and has been so for thousands of years. During all that time it has been born and reared in captivity, a condition made possible because the females do not fly at all, and the males not very well. This creature, supposed to have originated in the wilds of the Himalayas, and first domesticated in China, has less liberty than our poultry; it is as much a creature of the home as a canary, but instead of a cage it has an open tray where it passes all its larval days, feeding on mulberry leaves.

As a moth the female lays 300 or 400 eggs, and these are hoarded by the silk farmer like precious seed of plants. It may be necessary to keep the eggs in cold storage for a while to prevent their hatching when the trees are not in leaf; it may be necessary to hasten the hatching. This is done, in primitive society, by the man himself. He carries the eggs in a bag placed next to his skin by day, and beneath his pillow by night. Generally, however, the forcing process is effected in an incubator.

THE GREAT SHEET OF SILK MADE BY A CATERPILLAR

The hatched caterpillars feed on their mulberry foliage, and moult and grow like ordinary caterpillars until they reach a length of from two or three inches; and when many are feeding together, the sound of their munching is like that of a breeze in the trees or the murmur of a distant sea.

The time of harvest comes when the cocoon is woven; for this various aids are provided—twigs, paper spirals, nets, all to afford easy anchorage for the threads on which the cocoon is to be slung.

The cocoon comprises an outer case of coarse silk, the floss silk of commerce, and within this the caterpillar makes a great winding sheet of pure silk in which to sleep and undergo its transformation.

This inner shroud is wrought by the spinning together of a double line of silk. The sticky fluid which contact with air changes

into this marvellous material is emitted by both spinnerets, and is joined to form one line, which reaches a length of from 1000 to 1200 feet or more—say 2400 feet of silk of single line.

Within this cradle the caterpillar casts its skin and becomes a chrysalis, awaiting resurrection into a perfect moth. But such a consummation defeats the entire purpose of the silk farmer, for the moth, to escape from the cocoon, must emit a fluid from her mouth which dissolves the silk at one end, and so ruins the whole. So it is but few for whom there comes an awakening. Just a sufficiency of males and females to be the mothers and fathers of the next generation are spared to hatch. The remainder of the cocoons are submitted to artificial heat which destroys life in the unconscious pupae, and it is human hands and man-made machinery that unwind the lovely silk woven by a worm to be its secret place of retirement during the slow working of a natural miracle.

The silk which the birth of a moth would spoil is unwound and rewound, washed, dyed, manufactured, to deck a queen, a bride, to help the surgeon in his work, the balloonist in his flight, and to be the staple of one of the richest commercial enterprises in the world. The latest statistics published in 1924, show that Great Britain pays over two millions a year for raw silk, and over twenty millions for silk manufactures imported, to say nothing of the immense internal trade in our own factories. What, except the earthworm, among things that crawl, can compare with this unhandsome wonder-working grub?

HOW THE SECRET OF THE SILKWORM WAS BROUGHT INTO EUROPE

And what in all Nature has a stranger history? There is the story of the silkworm in China, tended for ages by royal hands and kept as a national secret, till a Chinese princess, marrying an Indian prince, smuggled silk moth eggs out with her, and taught the mystery to the people of India. Then there is the tale of the two Persian monks who, with eggs concealed in hollow canes, walked from China to Constantinople, and presented their stolen treasure to the Emperor Justinian, from whose careful treatment of their gift Europe for 1300 years derived her store of silk and silkworms.

Some other insect friends not named here may occur to readers, who will recall with gratitude the work of some of the water-

haunting creatures which have been mentioned elsewhere. But think what our ponds, pools, and ditches would become but for the appetite and ardour of our water boatman, with the extraordinary hind legs he uses as oars, looking as he rests motionless like sculls.

He is a snapper-up of minute forms of life, and, where the numbers of his own kind become excessive, he turns on them as well. The agile pond skater, to which the surface of the water is as sure footing as land is to us; the water spider, with its castle of silk hidden down below, the raft spider with its punt of leaves, these and other little people of still depths are constantly at work, for their own benefit primarily, yet no less for ours.

THE GOOD WORK DONE BY THE TIRELESS SCAVENGERS OF OUR STREAMS

But for them our pools would become intolerably overcrowded with life, and fluid tombs of innumerable corpses. They do for the dead what the sexton-beetles do with creatures on land on whom the hand of death has descended; they do with the living what the friendly carnivorous beetles do with shore forms of enemies of our crops.

Even the larval forms of mosquitoes are harmless, indeed beneficial, when in water, devouring substances which would cause corruption. Their mischief brews when they put on wings, and either distil a poison to inflame our blood, or become the carriers of microbes fatal alike to human and animal life.

Not all mosquitoes, as we have already seen, are transmitters of disease, and even where one species is guilty it may be only the female which sucks blood. Those mosquitoes that do this thing have influenced the course of history. Mosquito-borne diseases are now believed to have led to the downfall of Greece by the killing of adults and infants, and so undermining the constitution of the nation, that the one-time masters of the world, enervated and reduced in numbers by the arrival of mosquitoes, perhaps from conquered lands, fell a prey to other nations.

VAST REGIONS OF THE EARTH WHERE THE INSECTS HOLD MAN AT BAY

We are familiar with the thought that mosquitoes, transmitting malaria, yellow fever, and other maladies, held the world at bay when for centuries it sought in vain to build a canal across the narrowest part of the American continent to link

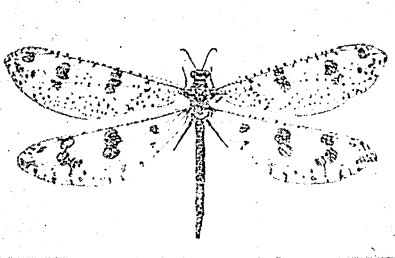
INSECT FRIENDS AND FOES

the Atlantic with the Pacific. But mosquitoes and the tsetse fly did more than that; for thousands of years they defied the efforts of the white races to possess and open up Africa. If we could master the tsetse fly and the Anopheles and Stegomyia mosquitoes, there is not a place in the tropics into which we might not venture, not a place in which we might not trade, work, and live in safety. These insects are the actual demons of the wilds and of countries fringing the wilds. The demons which fill a thousand legends of old-time travel were but the heated fancy of men who had seen their comrades die mysteriously from causes which our

butterflies and moth, the pea-moth, the clothes-moth, the gipsy-moth, the enemies of currants, or the cotton foes again.

Every crop they infest traces back to wild plants. There is practically nothing we grow for human use and consumption which is as Nature gave it us. Think of the original wild cabbage, still to be found in England; of the fruits we have evolved from a few poor wild species; of the wheats we have created from the original natural strain.

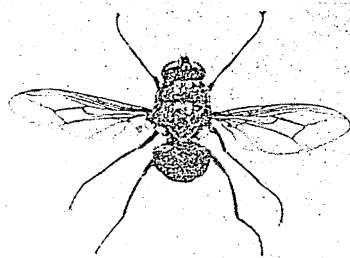
We have improved on the originals and multiplied their numbers a millionfold. Now the parasites have increased with the increase of their foodstuff, bettered for



THE ANT-LION IN ITS WINGED STAGE



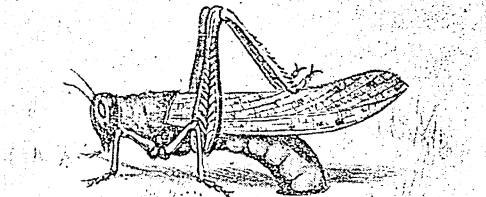
THE ANT-LION



THE TSETSE FLY



THE LOCUST



THE LOCUST DEPOSITING ITS EGGS



CHALCID FLIES

own generation has learned to trace infallibly to insects.

They still guard the Dark Continent and other steaming lands more effectually than any of the dragons mounted over the treasure of the fairy tales. They are there, and they were there before man arrived.

It is another chapter in the long story of changed habits on the part of Nature's children. We increase the number of our enemies when we convert their native food into something better in quality and quantity. Look at the pests of our farms and gardens—commonplace things like the carrot-fly, the celery-fly, the onion-fly, onion-maggot, apple-maggot, the cabbage-

them as for ourselves by the fostering hand of Man. They have turned from the wild species to the cultivated, and prosperity has made them so numerous that they threaten to overwhelm the cultivators who unwillingly benefit them.

Insect species may possibly grow fewer, though the theory is that they increase; undoubtedly they grow in number of individuals, their tide rising with the tide of vegetation which human genius and industry place at their disposal.

Cotton boll worms and boll weevils were never a plague until cotton was intensively cultivated in America and Egypt. The gipsy-moth was never a plague

anywhere till it was accidentally introduced into America from eggs blown out of a scientist's window in Boston and allowed to develop unobserved for some years at large. Since then it has done more damage in America than perhaps all other moths put together.

The Colorado beetle was an inoffensive browser on wild growths in the far western States of America, but changed its diet to potatoes, and in the course of a generation marched across the entire continent from west to east, destroying potato crops entirely where its ravages were unchecked.

HOW THE GERMANS STAMPED OUT THE COLORADO BEETLE

No other enemy to human food has ever created such a panic as this little monster. Practically every European nation has passed laws forbidding its introduction into the Old World. Nevertheless, in spite of all precautions, some years ago the beetle mysteriously appeared in Germany's potato fields, far from the sea.

The beetle had been breeding quietly there, and was in great numbers when identified. Terror seized the district. Under official orders the affected crops were ploughed up, the fields were drenched with petroleum and set on fire, and the pest was stamped out.

If we could pursue heroic measures such as those in all neighbourhoods where men abide among insect enemies, we could stamp out such frightful scourges as elephantiasis, pellagra, plague, yellow fever, malaria, beri-beri, relapsing fever, scarlet fever, sleeping sickness, and could banish practically all the epidemic diseases afflicting our horses, cattle, sheep, pigs, and poultry.

THE VALUE OF CLEANLINESS IN THE FIGHT AGAINST DISEASE

If cleanliness were observed in our homes, and fleas, bugs, and lice were destroyed, as they might easily be, we should conquer the deadly diseases of which these loathsome insects are the carriers. Politeness forbids the mention of their names in decent society, yet the louse alone, in addition to carrying typhus, caused the Allies the loss of a million men during the Great War on the Western front alone by compelling their withdrawal from the lines as victims of trench fever.

The scourge continued unchecked for four years; then, in six months, a committee of experts traced the evil to its source. Before our human enemies could

be defeated and the freedom of the world assured, we had to fight the louse, which was undermining our strength in the field. But these abominable vermin are tolerated in the slums of every civilised land, though England has a law enabling the police to enforce their suppression—a law never, unhappily, put into operation.

Fleas, ticks, mites, and the tribes to which the more loathsome human parasites belong are among the chief foes of mortal life, at home, in the tropics, in every land which has warmth enough to hatch the eggs of these little horrors.

As civilisation throws out its borders, advancing farther into the wilds to make new homes, new villages, and new cities, the peril is great, for the opening of a new highway across Africa may create a channel along which sleeping sickness can march, bringing death to hundreds of thousands. A flea on a stricken rat may set going a wave of plague which sweeps along the old route, across Asia into Europe, depopulates whole districts in India, decimates great districts in Russia, and blights unenlightened populations of backward Europe.

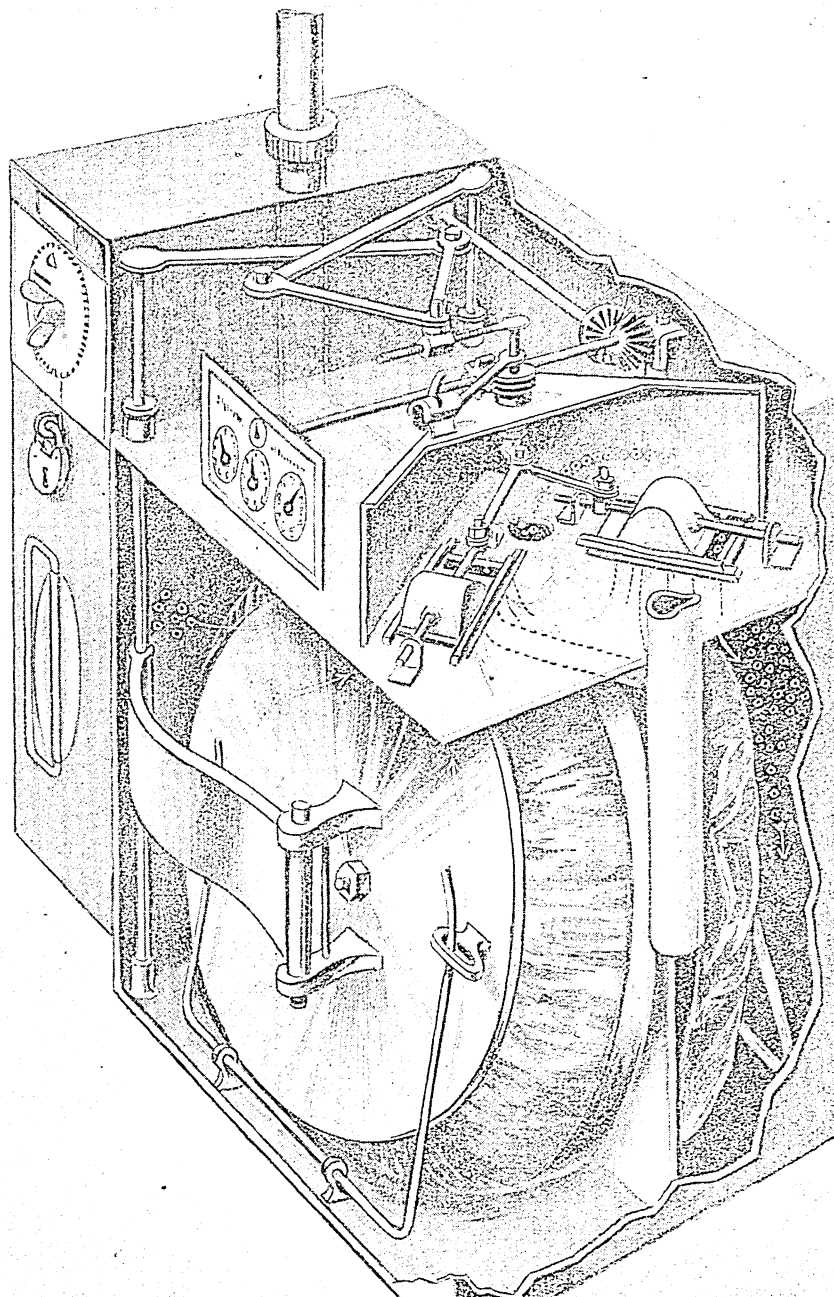
THE PESSIMIST'S DREAM THAT WILL NOT COME TRUE

The insect problem is the greatest problem we have ever faced. Physically, we shall obtain our millennium if we master the insect; otherwise the world's family may be destined to experience a fate foreshadowed in this gloomy dream of a modern writer:

"When the Moon shall have faded from the sky and the Sun shall shine at noonday a dull cherry red; and the seas shall be frozen over, and the ice-cap shall have crept downward to the Equator from either Pole, and no keel shall cut the water, nor wheels turn in mills; when all cities shall long have been dead and crumbled into dust, and all life shall be on the very last verge of extinction on this globe; then, on a bit of lichen, growing on the bald rocks beside the eternal snows of Panama, shall be seated a tiny insect, preening its antennae in the glow of the worn-out Sun, representing the sole survival of animal life on the Earth—a melancholy bug."

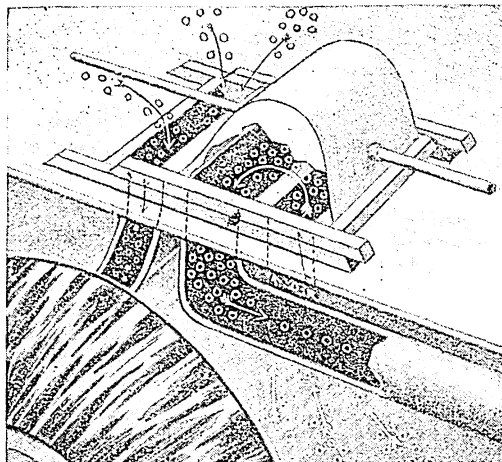
It will not be. The time will come when, with war out of the way for ever, Man will turn his brain to a nobler warfare than the killing of his fellows, the warfare for health and safety and cleanliness and happiness in every region of the Earth. The power is in his hands; it is for him to use it.

PICTURE-STORY OF THE GAS METER

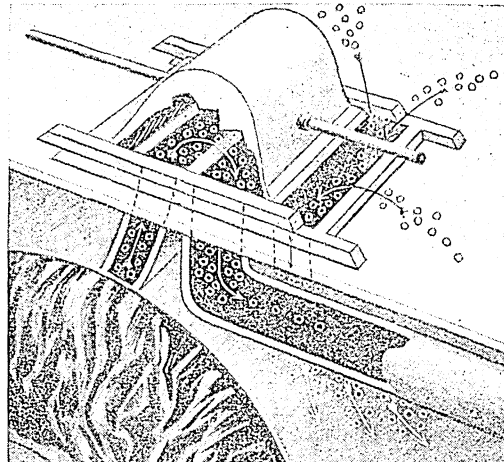


1. This picture shows us what a slot gas meter is like inside. The meter actually consists of four compartments: a big one on the left containing the automatic supply mechanism; two big compartments next to this, each containing a bellows; and above these a compartment known as the valve chamber, containing two slide valves and the recording mechanism. The gas enters the meter through the top pipe on the left, passing into the valve chamber and down the ports as indicated by the bubbles, one port leading to the outer chamber on the right, while the other leads to the bellows on the left. When each is filled the action is reversed, the chamber on the left being filled with gas and the left bellows emptied, while the bellows on the right is filled with gas and the right outer chamber is emptied. As the gas goes out it passes into the service pipe on the right. Connected to each bellows is an arm, which is again connected to a rod which works the recording instruments in the top compartment, through various cog-wheels and also causes the domes of the valves to slide along, covering and uncovering different ports leading to the bellows and outer chambers.

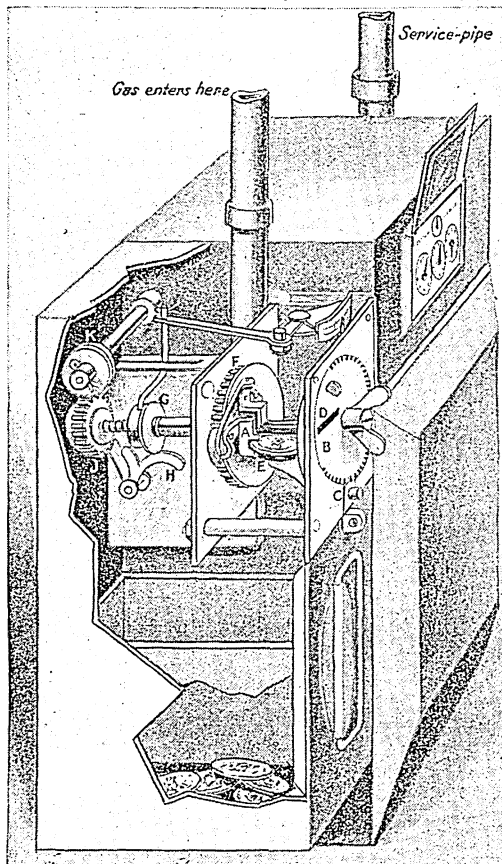
WHAT THE GAS METER IS LIKE INSIDE



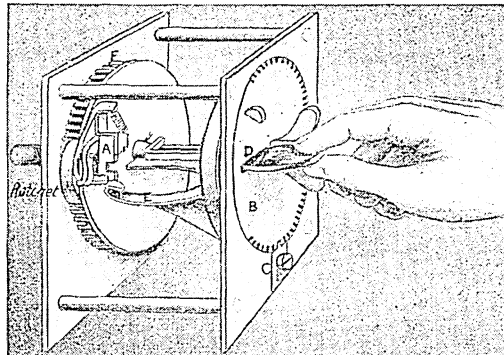
2. Of the three ports to each valve one is uncovered, the others being covered by a sliding dome. Here the bellows is being filled with gas, an action which forces the gas from the outer chamber up through the port on the right beneath the dome and down the middle port into the service pipe.



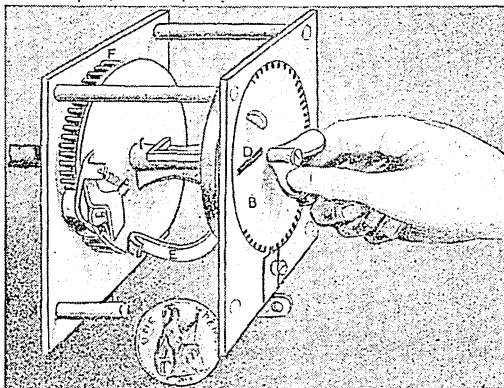
3. While that happens the other valve does the opposite. Gas pours through the open port leading to the outer chamber, and the bellows is thus forced to empty itself of gas, which finds its outlet up through the port on the left and down the middle port into the service pipe.



4. This is the compartment containing the automatic supply mechanism. The dial B is set by the gas company to supply so much gas by locking the dial at point C. When a coin has been placed in the slot D and the thumbscrew turned, the coin takes A with it, as described in picture 6, and draws forward the wheel G, which, by depressing the lever H, turns on the gas. The gas then enters the bellows and the pressure sets in motion the mechanism already described, causing the spindle K to rotate. A worm at the end of K engages with the cog J, and by the time the bellows has been filled a certain number of times G has gone back to its original position and pushed back H, causing it to turn off the gas. The ratchet in connection with A has also gone back to its original position, moving with the cog-wheel F.



5 and 6. The coin is inserted at D and falls into the carrier E, fitting into the slot A, where it forms a cog. The thumbscrew is turned to the left as seen below, and takes a little ratchet over a number of teeth of the cog-wheel F, which does not move in this direction, to the position fixed by the gas company. The penny then falls into a box below.



Plain Answers to the Questions of the Children of the World



The Physician's Visit—From the painting by Jan Steen

WHY DOES THE DOCTOR FEEL MY PULSE?

MOST of us have seen the doctor place his fingers on a wrist, and have heard someone say that he was feeling the pulse. If we do the same we shall feel something throbbing just underneath the skin, a little tube expanding and contracting seventy or eighty times a minute. That is just what the pulse is. It is a wave of blood sent along an artery by the force of the beating of the heart, and as the wave is confined inside this vessel, or artery, which was already full of blood, the artery has to expand in order to receive the blood pumped into it. Each time this happens we feel the throb, so that by feeling our pulse, and counting how often it beats or expands in a minute, the doctor can find out how often our heart is beating in the same time, because each throb of the pulse corresponds to a beat of the heart. We should understand, however, that the pulsating movement is not only to be found at the wrist; it occurs in every artery all over the body.

The rate at which the pulse beats and the height of the temperature in the body have a distinct connection with each other, and go more or less together, so that when the doctor counts the pulse rate, and finds that it is just the rate it should be, he expects also to find the temperature quite

usual. If, however, he finds that the pulse is twice as fast as usual, he will also probably find that the temperature is much higher than normal, because the thing that causes the one to become rapid causes the other to go up. Thus, in all cases of fever, where there is some poisonous substance in the body, this substance causes the heart to beat quickly, and the pulse to become rapid, and it also causes a disturbance in that part of the brain controlling the temperature.

So the pulse, felt by a trained finger, gives a great deal of information. It tells not only how often the heart is beating in a minute, but how strongly the heart is beating, and how regularly. It tells whether the heart is strained or labouring or over-excited, or just beating easily, as it ought to do. The pulse also tells the state of the arteries throughout the body, as to whether the muscles in their walls are tightly contracted or lax; and it also tells how much pressure there is inside the blood-vessels of the body between the heart-beats. This question of blood pressure is enormously important, for it affects the working of every part of the body. The temperature can also sometimes be told from the pulse. Of all the single things a doctor could do, feeling

FIRE · WIND · WATER · LIFE · MIND · SLEEP · HOW · WHY · WHERE

the pulse tells him more than any other ; more even, on the whole, than looking at the patient's face, and vastly more than taking his temperature or thumping him, or even listening to his heart-beats.

Why is the Centre of a Gas-Flame Blue and the Outside Yellow ?

The colour of a burning or a hot thing depends largely on the hotness or temperature of it. A white-hot poker is hotter than a red-hot one ; and a white-hot star like Sirius is hotter than a red-hot one like Aldebaran or the Sun. The outside of a flame is far hotter than the inside, and gives out a brighter light in consequence, like a hot star or a hot poker. Also the metal sodium, when hot, gives a yellow colour, and sodium is scattered everywhere. But the sodium in the gas is not hot enough to glow except in the outer part of the flame. If you have a carefully arranged flame you may hold a match in the centre of it without the match taking fire. Now you will ask why the inside of a flame is colder than the outside, and the answer is easy. The outside of the flame is the part next the air—next the oxygen—which causes the burning. The inside of the flame has to be content with the very small amount of oxygen which gets to it, still unused, through the outer part of the flame. Where the burning is fastest and most complete there the heat is greatest, and therefore the outside of the flame is hottest.

What are the Elgin Marbles ?

At the beginning of the nineteenth century, Greece was still subject to Turkey, and the Acropolis at Athens was used by the Turks as a fortress. The splendid monuments of Phidias and his pupils were neglected, and even ran a considerable risk of being destroyed. Seeing the danger, the Earl of Elgin, then British ambassador at Constantinople, succeeded in obtaining a firman from the Porte to examine, measure, and move certain stones on the Acropolis ; and in 1812 the wonderful collection now known as the Elgin Marbles was sent to England. It includes statues and part of the frieze from the Parthenon, a figure from the Erechtheum, a statue of Dionysus, and part of the frieze from the temple of the Winged Victory. Altogether it is said to have cost Lord Elgin £74,000. A fierce controversy arose when it was suggested that the Government should buy the

collection, and some people even questioned the artistic merit of the statues which were the glory of ancient Greece.

But fortunately the Government made up its mind to purchase it, and the collection has ever since been one of the chief glories of the British Museum. The credit for saving these precious works of art from destruction is entirely due to the exertions of Lord Elgin.

If Men are Growing Taller will they Ever be Twice as Big as Now ?

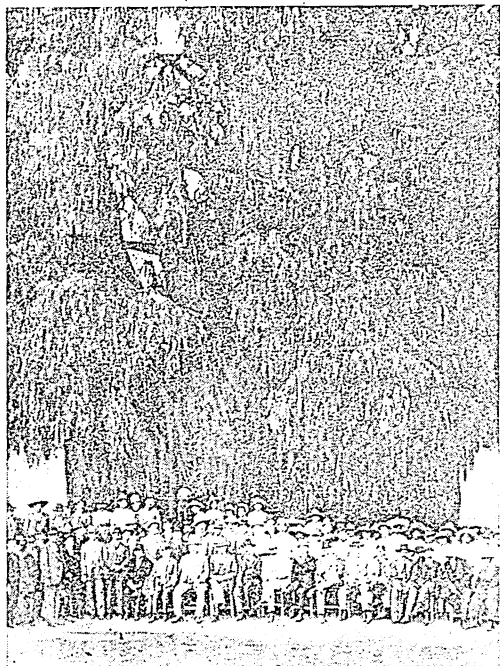
The answer is certainly No. Our increase in stature as compared with our ancestors is due to better conditions of life. We are far cleaner than they were, and eat more regularly. We have better and more nourishing food, and we protect ourselves better from great cold and heat. It is said that people have increased in height about an inch in a thousand years, and this change in height is due to circumstances, and not to any change in the nature of the body. It is only that our ancestors were not as tall as they should have been, and we, on the whole, are nearer the height that we should be. When we go back to the earliest remains of human beings we find that the average stature of mankind has been very constant. The ancient Egyptians of 5000 or 10,000 years ago were rather short, as modern Egyptians are. Men of a far more remote age, perhaps 25,000 years ago, were quite as tall as the modern Scot or Swede. Indeed, we learn no more important lesson from the past than that the physical type of man is very nearly fixed. It is his mind that grows.

What was the Unicorn ?

An ancient Greek author, Ctesias, tells in his writings of a white beast resembling a horse, exceeding swift, and with one straight horn a cubit and a half long. It was called the Unicorn, and was supposed to live in India, while it is mentioned several times in the Bible. Though extremely unlike a horse, the rhinoceros is believed to have been responsible for the legend. The unicorn, for some unknown reason, was adopted as a badge by the Scottish kings, and, when England and Scotland were united under James the First, it was added to the arms of the United Kingdom. It was regarded generally as a symbol of purity, but when used in the decoration of drinking cups it is a sign of the ancient belief in the efficacy of the unicorn's horn against poisoning.

What is the Oldest Tree in the World?

No one can say definitely, but there seems little doubt that the giant sequoia trees which grow on the slopes of the Sierra Nevada in California are the oldest living things on the Earth. They are certainly between 2000 and 3000 years old, and some of the bigger ones are estimated to be even 4000 or 5000. Compared with these the ancient Cedars of Lebanon, some probably 2000 years old, are mere children. It was at one time believed that the cedars still left standing were contemporaries of those cut down in Solomon's time, but this is doubtful. In England some giant



THE BIG TREE OF SANTA MARIA

yews are the oldest trees now living, one near Staines in Middlesex being probably a thousand years old.

One of the famous old trees of the world—the great German scientific traveller Von Humboldt thought it the oldest tree on Earth—is the big tree in the churchyard of Santa Maria, in the little village of Tule in Mexico. This village lies in the midst of a sun-baked plain in the valley of Oaxaca, and is inhabited by Red Indians.

This giant tree is a species of cypress. Its actual age is not known, but it must be thousands of years. In the time of Cortes, who rested with his soldiers in

the shade of its branches, the natives declared that when their forefathers came to the valley of Oaxaca hundreds of years before the arrival of Cortes, this tree was a thing of wonder even then.

It measures 160 feet round the trunk a few feet from the ground. We get an idea of what this means if we realise that it requires 28 people with their arms outstretched, all touching the tips of each other's fingers, to completely encircle the tree. Being of the bushy variety of trees it is only 160 feet high, but it has a great spread of branches, measuring about 140 feet. The trunk does not represent a regular and perfect circle, but is rough and rugged, with many ins and outs. It is made up of a group of quite compact sections, not unlike the cottonwood trees. When Von Humboldt visited this tree, he was so impressed by its stately magnificence that he placed on it a metal tablet with his name and inscription.

Why Does a House Become very Dusty if we Lock it up for a Year?

The air is simply laden with large and small particles of dust. We are able to see a sunbeam because some of its light is stopped by the particles of dust in the air, and is reflected from them to our eyes. It is really dust that we see. Now, if air is kept perfectly still, these particles of dust will slowly settle. They are not very heavy, but they are heavier than air, and in time they must certainly fall if the air becomes quite still. So if we pass a beam of light through a cellar, where the air has long been undisturbed, we find that it is invisible. That is because the dust has all settled down out of the still air in the course of time, and it explains why a house becomes so dusty when it is locked up. The air being still and unchanged, and no light entering, probably no new dust is made, or very little; but the dust which was in the air simply settles. When it was in the air we did not notice it, but now we do. We breathe in many millions of tiny dust particles with every breath we draw. If we breathe through our noses, the greater part of the dust that is in the air is prevented from reaching our lungs.

What Do the Letters B.M. on a Penny Mean?

The letters are the initials of Sir Bertram Mackennal, R.A., who designed the coinage for King George the Fifth.

Why do Loud Noises Make us Deaf for a While ?

This is partly because a very loud noise makes such a very strong and powerful impression at the time that no other impression of the nature of a sound can be appreciated till the first one has disappeared. It is the same with other sensations. We cannot feel more than one very intense sensation at once, and the attention of the mind is given to the most powerful. The deafness following a loud noise, or a box on the ears, is also partly due to the changes in the position of the drum of the ear and the delicate internal parts which take a little while to return to their natural position, because until they do this no other sounds can be properly appreciated.

Why does Water Crackle when a Red Hot Poker is put in It ?

The crackling noise is due to the bursting of little bubbles of something. A bubble is a closed envelope of fluid containing a gas of some kind. Usually the gas is rather compressed, and as it expands it stretches and makes thin the liquid envelope until it bursts. Then the gas escapes and expands very suddenly, and makes a little explosion, starting the waves in the air which we hear and call sound. It only remains, then, to find out what makes the bubbles in the water. A cold poker will not make them. Therefore, it is not the iron of the poker, nor the shape of the poker, that makes them, but its heat. With nothing else but its heat will the poker make bubbles. It is not difficult to see how the heat does this. It rapidly turns the water near it into gas, and this gaseous water, and also the air dissolved in the water, forms bubbles of hot, compressed gas surrounded by an envelope of liquid water. These are quickly made and quickly broken, and in breaking they make the crackling noise we hear.

Why do Our Feet not Wear Away as Our Boots and Shoes do ?

There is a remarkable difference between living things and dead things. Boots and shoes are composed of dead tissues which have no further power of growth, and therefore cannot replace those parts of them that are worn out by friction. Our feet, however, are made of living tissues, and the effect of friction and use, when applied to living things, is to cause these tissues to increase in size instead of

wearing away. Indeed, if living tissues are not exercised they will not grow properly. In a single sentence the answer to this question is that boots and shoes wear out because they are dead, while our feet grow because they are alive.

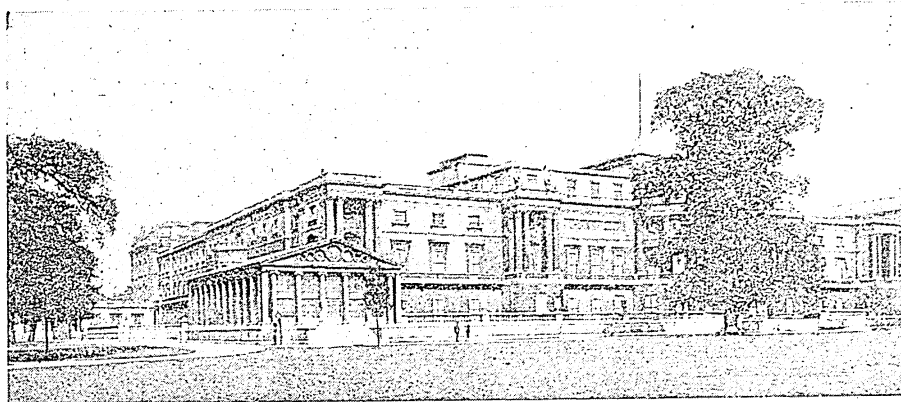
Why do Some Birds Fly so High ?

This is why they fly so high. If you stand on the top of St. Paul's Cathedral on a clear day you can see nearly all over London. The higher you go the more you can see, if your eyes are strong enough. These birds have very strong sight. Their eyes can see as well as ours would if we used a telescope. The big birds look down from the great height at which they are flying, and they see many birds flying below. These birds below watch the Earth. They see food thrown away by men and placed in the garden by children, and in a moment they fly down to get it. The bird which is right up in the air knows what they are doing, and swoops down quickly to take its share. These birds get a good meal. If they did not eat that food it would soon become bad in the sunshine and make us ill ; but it serves the birds for a good dinner, and by eating it the birds save us from being ill. So Nature looks after her big family, and preserves it from destruction.

What was the Black Death ?

The terrible Black Death which desolated Asia and Europe in the fourteenth century was the most powerful epidemic of pestilence recorded in history. It broke out in China, where it is believed to have been caused by floods, earthquakes, and famines ; and from there it overspread the Old World till even Scotland and Ireland mourned thousands of dead. There are said to have been 13 million victims in China, while in the whole of the East there were 37 millions. In England the pestilence raged in 1348 and 1349, in 1361 and 1362, and again in 1369, till the population was reduced perhaps by a third. In London, 100,000 people died, 50,000 being buried where Smithfield now stands. Norwich had 60,000 victims. The epidemic was probably a severe form of the bubonic plague of the East, and those stricken by it died usually in two or three days, sometimes in one. Labourers became so scarce that wages were doubled, while much cultivated land had to be converted into pasture. This revolution in agriculture led to serious trouble in later times.

The Story of the Beautiful Things in the Treasure-House of the World



Buckingham Palace from the grounds

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THE best known of the many architects who followed Sir Christopher Wren was John Vanbrugh. He was born in 1664, and died in 1726.

Vanbrugh's father was "a rich sugar-baker," the son of a naturalised Flemish Protestant who had taken refuge in England from the Spanish persecutions. Vanbrugh was something like Inigo Jones in this, that the first part of his life was passed in other occupations. He was educated in France, and soon became a well-known figure in brilliant circles.

For some years Vanbrugh was absorbed in literary work, chiefly plays. Then suddenly he turned his attention to architecture, and produced a set of wonderful buildings that would have been works of genius had Vanbrugh had better taste in certain matters, and had he approached the subject in the right way. He seemed to look at a house from the point of view of a scene in a theatre, as a painter might. He was interested in it as a spectacle more than a piece of construction, and consequently was always trying to make the practical part of a building live up to the picture he had made of it.

Vanbrugh's best-known works are large country mansions like Castle Howard, Seaton Delaval, Blenheim Palace, Grims-

thorpe, and the least attractive part of Greenwich Hospital. This architect was a great favourite at Court, and was knighted in 1714. Twelve years later he was dead, never having ceased developing as an architect, always possessed of a great idea of giving an impression of stupendous size to the mansions he was building in various parts of England.

Nicholas Hawksmoor is remembered in connection with Wren and with Vanbrugh. He was at various times assistant to both men. Hawksmoor is best known in London by the church of St. Mary Woolnoth, in the City, St. George's, Bloomsbury, and Christ Church, Spitalfields. The steeple of St. George's ranks with those of St. Bride's and Mary-le-Bow. These three may be generally considered the finest Renaissance steeples in London.

In the buildings Hawksmoor set up at Oxford he has left traces of bad design as well as good. He was responsible with Vanbrugh for the Old Clarendon Press building. The best memory Oxford has of Hawksmoor is in parts of Queen's College; the worst in parts of All Souls. He combines in his good work something of the genius in construction that he learned from Wren, and something of the sense of the spacious and magnificent that Vanbrugh taught him.

PICTURES · STATUES · CARVINGS · BUILDINGS · IVORIES · CRAFTS

There was in England during the early part of the eighteenth century an extraordinary and widespread interest in architecture, and also much general knowledge of the arts of building. The reconstruction of the City by Wren and his helpers had not been a matter restricted in interest to the architects, masons, and carpenters responsible for the work; all the society of London had been interested. When Queen Anne passed an Act for the building of another fifty churches in 1711, the interest grew. Not only was a great number of public buildings arranged for, but the erection of private houses became the fashion. Everybody who could afford it must have a new home built in what was left of the Renaissance style. Gentlemen who had leisure played at being architects, and designed their own mansions. They were so proud of calling themselves architects that they went to considerable pains to hide the traces of the practical men who stiffened the first designs and supplied the working drawings.

MEN OF NOTE IN THE ARCHITECTURE OF THE EIGHTEENTH CENTURY

Lord Burlington was one of these amateurs. He has been given credit for designing, among other buildings, the arcade and part of Burlington House, Piccadilly, where the Royal Academy is now housed.

All these architects, professional and amateur, and a good many builders and carpenters as well, had a good knowledge of the principles of Renaissance architecture as laid down by Palladio. Nothing was produced save on Italian lines. And although no buildings arose that even faintly rivalled the creations of Inigo Jones and Wren, most of the architecture of the eighteenth century was sound in construction and pleasing in appearance.

A great many names are connected with the century. On the eve of it lived Henry Bell of King's Lynn, Jarman, and Wynne, who built the beautiful Newcastle House in Lincoln's Inn Fields. Then there were Vanbrugh and Hawksmoor, whom we have already mentioned, James Gibbs, Archer, William Kent, James, Colin Campbell, Vardy, and many others.

In a second group may be classed the Woods of Bath, the old and younger Dance, Chambers, and the brothers Adam. Campbell and Gibbs are the worthiest names of the first group, Chambers and the brothers Adam of the second.

James Gibbs has been called a master in the designing of spires and steeples,

an art he learned in Italy. He was born in Aberdeenshire in 1682, and from 1709 lived and worked mainly in London. Like "Mr. Jones, Traveller," he was fortunate enough to spend several years abroad, some of them in Rome, where he made a great many drawings and studied architecture. His settling in London coincided with the new movement in building caused by the Queen Anne's Churches Act. The commissioners in charge of the work called in Gibbs. He spent the rest of his life, to 1754, in architectural labours in England.

TWO BEAUTIFUL LONDON CHURCHES BUILT BY JAMES GIBBS

In London Gibbs is chiefly remembered for the lovely little church of St. Mary-le-Strand and St. Martin's-in-the-Fields, which is generally considered his finest work so far as churches are concerned.

Gibbs's profession carried him here and there in the country, setting up a great many buildings we have not space to mention. In Cambridge he built the Senate House, and at Oxford the Radcliffe Library, which Gibbs thought was the best design of his life, and many people think is the finest building in Oxford.

Like most of the eighteenth-century architects, Gibbs sacrificed comfort to style in his domestic buildings. His chief concern was to set up magnificent houses; people must live in them as best they could. Gibbs was a very learned architect, and naturally was a great admirer of Wren, and he succeeded in catching here and there something of the master's spirit. The lofty Wren tradition seemed to die with him.

THE SCOTSMAN WHO LEFT HIS MARK ON THE BUILDINGS OF ENGLAND

Colin Campbell, another Scotsman living about the same time as Gibbs, made a mark of his own on the England of his day. Unfortunately, a good deal of his work has been destroyed, like his fine Rolls House in Chancery Lane, which disappeared as late as 1895. The best remains of his architecture are the mansion at Houghton, in Norfolk, which he designed for Sir Robert Walpole, and Mereworth Castle in Kent, an unusual kind of house built on the lines of a Palladian villa.

Kent, another of this eighteenth-century group, built, among other things, the Horse Guards, Whitehall, and Holkham, Norfolk. Kent was an accomplished, clever man. Walpole described him as

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"painter, architect, and the father of modern gardening." Had he been a little less generally clever, he might have been a more gifted architect. He is a fair example of the people who took up architecture after the great period of the Renaissance had waned.

Houses began to be more comfortably built as the century went on. A large number of halls were added to the stately homes of England. The Woods of Bath were responsible for some pleasant and attractive mansions in and about the town whose name is always linked with their own. James Paine did a good deal of honest work in domestic architecture. He also built several beautiful bridges. That at Kew is the finest; Richmond Bridge, and those at Chertsey and Walton are excellent examples of his work.

Paine has been generally overshadowed by Robert Adam. This man and his brothers were great forces in the last part of the eighteenth century. They have left their stamp for ever on London, and they also set up some excellent buildings in Edinburgh and Dublin.

THE GREAT VALUE OF TRAVEL IN THE ARCHITECT'S CAREER

There were really four Adam brothers, the sons of William Adam, who was a well-known Scottish architect. Robert and James deservedly take the honours of the family, Robert being generally considered the leader. He was born in 1728, and after being schooled at Edinburgh University, had the good fortune presently to go travelling—that most invaluable education which all architects should have. He seems to have spent four years on the Continent, at Nimes, Rome, Venice, and other places.

In 1758 Robert began work as an architect, generally with his brothers as helpers, sometimes on his own account. Presently group after group of buildings arose which have given the Adam touch to Georgian architecture. The Adelphi, the east and south sides of Fitzroy Square, the back of Portland Place, and a lot of houses between Park Lane and Hanover Square were built by the brothers Adam. As far as public buildings are concerned, Robert Adam's best work is the screen to the Admiralty, the Record Office, Edinburgh. He also made designs for the new buildings for Edinburgh University. In 1792 he died, and was buried in Westminster Abbey.

The Adam brothers were very gifted in general decorative work, apart from their architectural skill. They had a very distinct taste in ornament and a sure instinct as to where it should be placed. There are many Adam doorways and fireplaces in London which, in shape and ornament, are a great lesson on what can be done in the medium used. They availed themselves of a great deal of stucco ornamentation, which proved more of a passing fashion than their architecture in general.

THE MOST IMPORTANT PUBLIC WORK OF THE EIGHTEENTH CENTURY

The other great name in the eighteenth century was William Chambers. He was born in 1726, travelled in the East and in Europe, became private architect to George the Third, was knighted, and died full of honours in 1796. He too was buried in Westminster Abbey.

Chambers is famous in English annals chiefly because of Somerset House, which was built from his design. It was the most important public work of the century, the only really national building set up. "All that pains and intelligence could do, Chambers did at Somerset House." To his gifts as the designer of fine buildings he added an enthusiasm for good workmanship. Nothing but the best in the way of material, the best in workmen and sculpture, would suit his fastidious taste.

The result is that Somerset House is one of the most satisfying buildings in London, and when it rose, with the river at high tide lapping its foundations and running up under the archway in the terrace, it must have looked a most beautiful as well as an imposing sight. Part of the loveliness of the water reflections has been lost since the building of Waterloo Bridge, and since the construction of the Victoria Embankment, which narrowed the waterway of the Thames.

SUMMER HOUSES WHICH WERE SET UP TO LOOK LIKE ROMAN BUILDINGS

Among Chambers's lesser works is an interesting building known as the Casino, at Marino, near Dublin. The architect set up many such erections in the grounds of private houses. They were designed in imitation of Roman buildings, and intended to serve as summer houses. In Dublin Chambers superintended a good deal of work, and his traditions were carried on later by his pupils, one of whom, James Gandon, built the Custom House, Dublin, and the Four Courts.

The name of John Nash is for ever associated with the end of the Georgian era. He lived from 1752 to 1835, and he tried to plan out the west end of London as Wren had tried to plan the City. His chief work was on Regent Street, to which he gave a fine sweep and the colonnaded quadrant.

Nash also planned out and worked on Portland Place, Regent's Park, the Marble Arch, the Haymarket Theatre, the Royal Pavilion at Brighton. He was employed on Buckingham Palace in 1825. Twenty years later his work was altered by Blore, and in 1913 the eastern front was refaced by Sir Aston Webb.

During the first half of the nineteenth century the architecture of England was passing through a state of chaos owing to what are now called the Gothic and the Classic revivals. The interest of the country was divided between these two styles. An enormous amount of building was done which lacked the dignity of the eighteenth-century architecture, its quietness, its comeliness, its Englishness.

THE FINE LIVERPOOL BUILDING WHICH DESERVES A BETTER ATMOSPHERE

It is always a bad sign in the history of a country's architecture when men go back to a remote period and slavishly copy it instead of adapting its principles to the needs, climate, and social life of their own country. We have an excellent example of this in St. George's Hall, Liverpool, built by H. L. Elmes in 1839.

A finer specimen of Classical architecture can scarcely be found in England. In fact, St. George's Hall is described as the most perfect design of the Classic revival. But because of the climate it is hopelessly wrong in Liverpool. St. George's Hall looms up there, a gloomy, depressing mass of architecture, nearly black with soot, with only now and again a day when the pillars really stand out against the portico shadows. The buildings that inspired the architect to plan the hall in this way—the Classic halls and temples of Greece and Rome—were constructed of shining white marble and stood under deep blue skies, gleaming in the clear Mediterranean air. Every plain, clear-cut line had its advantage. You never had to peer in the gloom to see where the pillar began and the shadow ended.

In London there is St. Pancras Church, in itself quite a good imitation of a Greek temple, but spoiled by the steeple which

was intended to remind London of the Tower of the Winds at Athens. The Royal Exchange is more at home, because its Classic portico serves the purpose that a Classic portico was intended to serve—it gives shelter to the people whose business takes them there. It is a meeting-place. The British Museum, the National Gallery, the Athenaeum Club, the Hyde Park Corner Arches, Euston Station Entrance, the Fitzwilliam Museum, Cambridge—are all outstanding examples of the result of the Classic revival, and probably, with St. George's Hall, Liverpool, at the head of the list, its best work.

OUTSTANDING EXAMPLES OF THE GOTHIC REVIVAL IN LONDON

The Houses of Parliament are by far the best work of the Gothic revival. Londoners can easily trace the workings of this movement in churches like All Saints, Margaret Street, St. John's, Red Lion Square, St. Pancras Station—apart from outstanding cases like the Law Courts.

A great many of the well-known and much loved buildings of London have already been mentioned in that part of this book which dealt with the Builders of London. In other parts of England, as in London, the nineteenth century saw the setting up of a tremendous array of buildings—stations, insurance offices, banks, asylums, hospitals, churches, public libraries, town halls. The Scottish National Portrait Gallery, by Sir Rowand Anderson; the Rylands Library at Manchester, by Basil Champneys, who also built Girton and Newnham Colleges, Cambridge; the Town Hall, Manchester, by Alfred Waterhouse; the Marischall College, Aberdeen, by Marshall-Mackenzie; St. Mary's Cathedral, Edinburgh, by Sir Gilbert Scott the elder; Truro Cathedral, by J. L. Pearson. These are a few names out of many.

THE CHANGING STYLES WHICH LED TO MODERN ENGLISH ARCHITECTURE

As the nineteenth century drew toward its end these fashions in architecture died out. Men began to think again of Inigo Jones and Wren, who had adapted Renaissance ideas and made something English of them. This harking back to our own two great geniuses was the beginning of a really fine thing—modern English architecture, which is not a slavish imitation of any one style and is slowly developing into something which will presently really belong, in spirit, to England and to no other country.

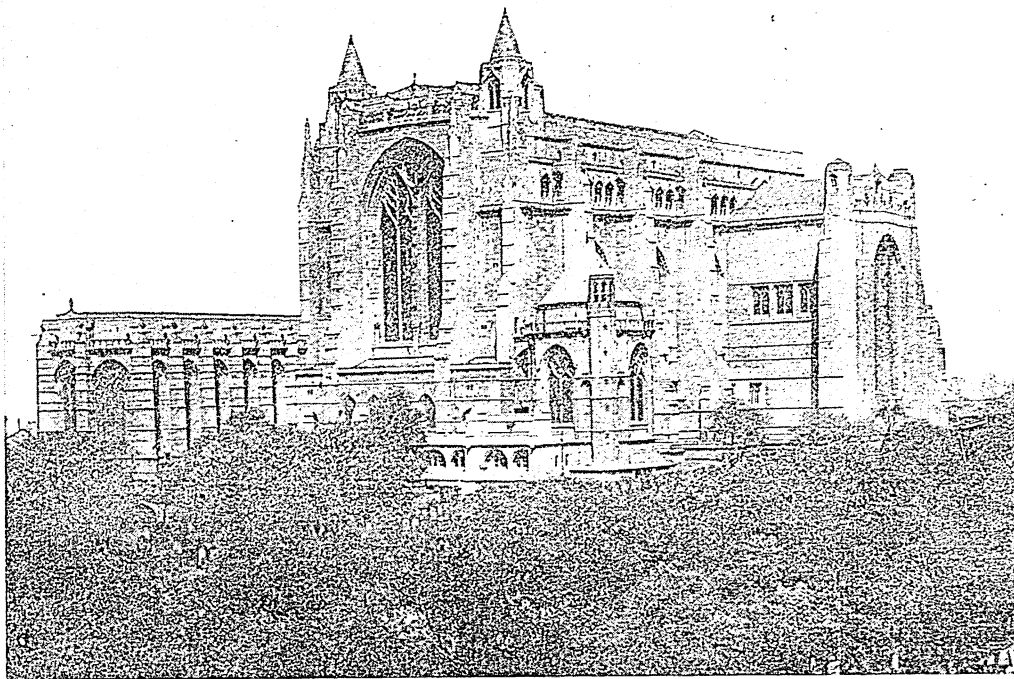
THE ARCHITECTURE OF TODAY

The man to be most remembered as a pioneer of our modern architecture was R. Norman Shaw, R.A., who lived from 1831 to 1912. He has had an enormous influence on contemporary building, and it is largely owing to his genius, filtering out in the ideas of the present day, that in a great many places London streets are changing for the better.

Shaw's earliest building of note was the very interesting New Zealand Chambers in Leadenhall Street, which first made architects realise a new power was in their midst. Later came the Alliance Assurance Office in Pall Mall, the Gaiety Theatre, the Piccadilly Hotel, and the

are public buildings in the new manner of which the generations to come may be justly proud.

Certain parts of London are altering almost daily—the "Aldwych Island," with Bush House ending the long and beautiful vista of Kingsway; the Strand; the end of the Mall, breaking out gently on to Trafalgar Square, through Sir Aston Webb's Admiralty Arch; Piccadilly Circus. But of these results it is early to speak. The great houses of trade, Selfridge, Peter Robinson, Liberty; Mappin's shop in Oxford Street, the Wolseley building in Piccadilly, and many others, are bidding fair to remove from our great city the



LIVERPOOL CATHEDRAL, BUILT BY SIR GILES GILBERT SCOTT

magnificent pile which is still known as New Scotland Yard—a notable piece of architecture. Shaw also designed a number of country homes and private houses in London.

The Institute of Chartered Accountants and the Electra Building, in the City, built by J. Belcher, R.A., give us some further instances of how this modern style may make magnificent commercial offices. The new War Office, by Mr. William Young; the College of Science, by Sir Aston Webb; the Board of Trade and Local Government offices in Whitehall, by Mr. J. C. Brydon; the new part of the British Museum, by Sir John Burnet

stigma of the bad work of the nineteenth century. Club houses like that of the United Universities, by Sir Reginald Blomfield, at the corner of Pall Mall, must before long make for a great distinction in West End London.

In Scotland and the provinces the same movement is spreading. *English* buildings are arising. Glasgow has got a fine start with the Town Hall, by Young. Many buildings of the modern character are appearing in Edinburgh, such as the Insurance building by J. M. Dick-Peddie.

Liverpool will make the century famous with her magnificent new Cathedral of the Church of Christ, by Sir Giles Gilbert

Scott. In various parts of England a number of very beautiful country houses have been built by Sir Edwin Lutyens, who seems rather unfairly to be remembered only because of the Cenotaph in Whitehall. This great architect has also left his stamp most magnificently on modern Delhi, India, by the Government buildings there; on Johannesburg, South Africa, by the imposing Art Gallery.

THE GREAT FUTURE OF CONCRETE AS A BUILDING MATERIAL

Since the opening of the Empire Exhibition at Wembley considerable interest has been aroused in concrete architecture. The Government Pavilion and the Palaces of Engineering and Industry are the chief instances of the new kind of building, and all the people who have seen them have been obliged to admit that something magnificent has been made out of mere concrete. Sir E. Owen Williams, an engineer and architect, has been responsible for these erections. It seems that for buildings and statuary alike, concrete is capable of great development as a building medium. It is cheap; within certain limits easily handled. We are very probably here at the beginning of an important new movement in engineering architecture, and it is impossible to say where it will end.

The architecture of our Dominions, to which the Exhibition has turned many people's thoughts, has followed more or less the lines of art in England. The Gothic and Classic revivals seemed to touch even the farthest bounds of the Empire. This was a great pity, because each country of our Dominions was slowly developing a spirit of her own.

THE FORGOTTEN WORK OF THE EARLY AUSTRALIAN ARCHITECTS

Architecture in Australia was hampered by this apparent necessity to do what England did in the middle of the nineteenth century. The result was that some of her early work, from which a national style might have developed, was forgotten or considered of little account.

The buildings of the old Colonial period were sometimes called Macquarie architecture, in association with Major-General Macquarie, who was Governor of New South Wales from 1809 to 1821. These erections did not assume any greatness of style, but were pleasant and harmonious, and native to the feeling of the young and growing country.

Howard Greenaway, a Bristol architect, who went to New South Wales in 1814, is

the name most remembered in those early days. When the idea of building in the Gothic and Classic manner came, about 1840, this early work was submerged. Now the new Australia is looking about and slowly finding an architecture of her own. In the meantime, certain buildings mark the passing of the generations—the Parliament House, Cathedral, and Public Library of Melbourne, the Customs House of Brisbane, the National Art Gallery of Sydney. Some beautiful modern houses are rising, with their shelved roofs and wide eaves and spreading verandahs, the climate dictating the lines of architecture. The natural instinct of these southern countries is toward horizontal, crouching masses. When Australia has come to her full stature a very fine architecture will be the result.

The same may be said of New Zealand. In both these countries, where the arts are concerned, it has always been necessary to "first catch your hare and then kill it." Nothing has lain ready to hand. Neither Australia nor New Zealand has a history and centuries of traditions behind her, like England, and the settlers for the most part have been too hard-pressed getting homes for shelter to trouble themselves much as to what appearance they had.

THE GREAT OPPORTUNITY OF THE ARCHITECTS OF NEW ZEALAND

Art and architecture are luxuries of a people secure in their commerce and their country's health. Australasia has life and time before her. It is probable that some very interesting concrete work will appear before long in New Zealand. In that country the shortage of building materials is slowly driving public opinion toward the realisation of what may be done in this new-old medium. In Auckland, Wellington, and Napier there are already a number of attractive buildings and some delightful private houses. It only remains for the coming architects of New Zealand to think for their country's sake, and not imitate some outworn style.

South Africa can look a little farther back. Her architecture began in the shape of a rough fort built where Cape Town now stands by the Dutch East India Company, in 1652. When the settlers from Holland came out the first simple elements of home-making appeared, naturally of a Dutch character.

The houses had the steep roofs of seventeenth-century Amsterdam dwellings. It

was the pride of the emigrants to make their new homes as much like the old as possible, only using thatch instead of tiles. When a couple of generations had passed, and the little towns had grown, the steep, thatched roofs were discarded because of the fire danger, and flat-roofed dwellings appeared.

In the meantime a new element had been added by the arrival of a body of French refugees who had been driven out of France during the religious persecutions of 1685. These people brought with them something of the exquisite native taste of the French, and a slight knowledge of Renaissance architecture. The Dutch and the French blended made the basis, as one can readily imagine, of a most interesting development.

The Dutch Reformed Church in Cape Town is one of the relics of these early years. It was finished about 1703. Only the clock tower now remains. About 130 years later, after the Colony was taken over by England, St. George's Cathedral was opened. This building was very far removed from the individual style of the old Dutch church. It was built in what has been called by unfriendly critics the "copy-book classic" style.

WHAT CECIL RHODES DID FOR ARCHITECTURE IN SOUTH AFRICA

For a considerable time after that wars and tumults swept over the Colony, and people had other things to think of than building. About 1895, at the instance of Cecil Rhodes, a revival of architecture began. Rhodes set Herbert Baker to work. His first constructions were in the old Dutch manner, and some very interesting houses were the result. Later on the architect developed a more Italian style which let light and space into these buildings. Baker's greatest work is the noble group called the Union Buildings, Pretoria. One of his remarkably fine houses is the Villa Arcadia, built for Sir Lionel Phillips.

Modern villas of excellent proportions may now be seen here and there in South Africa. They are hard put to it to rival the beauty of the old Dutch houses like Groot Constantia, built about 1690. Between the love of the old and the new the present day architect is hovering. A national style must needs be developed, but artists and builders know quite well what they have lost since machinery took the place of the old hand carving in which

the Dutch so excelled. So that if the old style is made the basis of the national architecture, a certain beauty, a sensitiveness about wood and carving, must needs be lost at the outset.

The architecture of America—Canada and the United States—is still in its youthful years, in spite of the fact that for three centuries it has received the impress of the older civilisations—the English, French, Spanish. Here again the continent has suffered from the need that nineteenth-century builders felt to imitate the work across the Atlantic. Had they kept to what they knew, looked at the buildings of an earlier date within their own borders and avoided the chaos of the Gothic and Classic revivals, a national style might sooner have been formed.

THE SPLENDID MODERN BUILDINGS IN THE TOWNS OF CANADA

Many important buildings in Canada belong to this era, erections like the Macgill University of Montreal, the Toronto University and the Parliament House at Ottawa. In the United States they make a vast array beyond the mention of a limited survey. Nowadays Canadian public buildings are freer from the old constraint. The Crane Building in Montreal, built by Hugh Vallance in 1923, is a daring work of a modern spirit; then there is the new Parliament building in Winnipeg, by F. W. Simon, the Birks Building in Montreal, by Nobbs and Hyde; the Union Station, Toronto, built in 1919, the Dominion Bank in the same city built in 1910, the Canadian Pacific Railway Station in Vancouver, built in 1912—all these show that in Canada the future is wide and full of great promise.

THE INFLUENCE OF U.S.A. IN THE HOMES OF CANADA

In the American continent there are a great many private houses in which the old European style is seen. Craigie House, Cambridge, Massachusetts, is a fine example, interesting to us because it was Longfellow's home. Houses like this built on the old French and English traditions, with hints of Adam work in the interiors, exist beside the most modern of modern dwellings. In the matter of new domestic and public architecture Canada is more sensitive to the influences across the States border than to those of Europe.

American architecture today is powerful, daring in its methods, facing in a direct fashion the problems of commerce, of

family life. In the matter of modern domestic architecture, economy of labour and comfort are the guides to architectural taste. Good American houses make the most pleasant homes in the world.

In that huge continent there are millions of blocks of offices—skyscrapers they are often called—where the only consideration the architect had to meet was the providing of hundreds of adequate, well-lighted and heated rooms. It would seem that the ground storey was at the bottom, the highest storey had a roof on it; in between lay some dozens of storeys each as much like the one above it as peas in a pod. The owners are quite content.

THE WONDERFUL BUILDING TWICE AS HIGH AS ST. PAUL'S

This extreme utilitarianism does not control the building of all the storeyed blocks. The most marvellous skyscraper in the world, the Woolworth Building, arose in New York about ten years ago, and, once its bewildering height accepted, its appearance is attractive. Mr. Cass Gilbert was the architect of this stupendous block, which is more than twice the height of St. Paul's, and has sixty storeys in the tower alone.

Other modern American buildings, dating from about 1890, are the Garrick Theatre, Chicago, the Monadnock Building and Masonic Temple, Chicago, the Ames Building and Tremont Temple, Boston, and Madison Square Theatre, New York. We know something in England of what American architecture can mean in Bush House, which was built by New York architects, and has restraint and dignity and beautiful contours without copying the work of any European school.

It is on these lines of individuality and sobriety that the new American architecture is moving and is bound to excel. Very probably the great school of architecture of the next century will be evolved across the water where there is money, courage, enthusiasm, a wide outlook, common sense, and a dawning instinct for art.

FRANCE AS THE LEADER OF THE WORLD IN ARCHITECTURE

To come back to Europe from these vast, energetic lands seems like stepping into the presence of an old and rather quiet and gracious person after having lived among crowds of gay and jostling youngsters. France still leads Europe, and the world, for that matter, in the realm of taste. She can afford to say "I think

this and I think that," with the Louvre and Notre Dame at her elbow, which all the combined resources of America, Australasia, and South Africa could not have achieved.

The greatest buildings of Europe which followed the centuries of the Renaissance are the Arc de Triomphe, the library of Ste. Geneviève, the Hôtel de Ville, the Opera House, the Petit Palais, in Paris; the Palais des Beaux-Arts in Lille, the Zwinger Palace, Dresden.

In Brussels has been built one of the most remarkable buildings of our day. It has been called the hugest accumulation of freestone in Europe—the Palais de Justice. Another remarkable erection is the Monument to Vittorio Emanuele the Second, Rome, designed by Sacconi.

The Museum and Opera House, Dresden, the Parliament House in Vienna, the many classic buildings in Munich, mark the passing of the nineteenth century in Germany and Austria.

AN OLD IDEA COMING BACK TO SCANDINAVIA

Scandinavia is developing an interesting architecture which will make its presence felt in the Europe of tomorrow. The Town Hall at Stockholm is a remarkable building and shows what a group of people can achieve whose minds are fresh and unhampered by the weight of tradition. In Sweden, indeed, it is quite easy to see that the people are pleasing themselves, and not liking what they think they ought to like.

In this small country a fine old theory is being newly expounded. It is that a beautiful object is likely in the end to be most satisfactory in practical use. Generally speaking, the feeling of builders has been that a practical building, like a factory or a block of offices, must first be useful, and if it can also achieve the beautiful, well and good; but the beautiful is a mere addition that can always be dispensed with. To this very sorry principle we are indebted for the millions of square feet of rank ugliness in commercial and trading towns.

Great architecture teaches us many lessons. One of the most important is that the man who has set up a beautiful building, be it a house or a barn or an office, a workshop or cathedral, has conferred on his fellow beings an everlasting good.

Pictures of many buildings mentioned here appear in Chapter 54 of Group 8.

The Wonderful House We Live In, and Our Place in the World



St. James's Palace London, where the first meeting of the Council of the League was held in England

THE LEAGUE OF NATIONS AND ITS WONDERFUL WORK

THE League of Nations has come into the world in response to the need for an international centre of thought and action. It has come at a time when nations are realising that no nation can live to itself alone, that each and all are closely connected, and that the good of one is the good of all.

From the earliest days men have recognised that strength lies in union. They have banded themselves together to resist attack and to increase the common good. That is the true value and meaning of a family, a tribe, a nation, and now, in the twentieth century, it is realised to be the only way for the world.

So was born the League of Nations, the great family to which all nations may belong, a Union of States working together for the sake of peace and progress.

This Union of States means a union of their Governments, and as those Governments think and decide well or ill, so will the League. The League can do nothing of itself; it *is* nothing of itself; only as the Governments agree can it act. It is, therefore, an exceedingly practical institution by which countries may obtain, by united action, more secure defence and greater benefit than is possible for any Government alone. The fact that the

nations are pledged, in the words of the Covenant, to deal openly, justly, and honourably with each other, to respect treaties, to obey international laws and to avoid war, marks an advance on anything that has ever before been tried.

A yearly Assembly of all the States in the League (they number 54 as the Children's Encyclopedia goes to press) is the great directing force which makes the final decisions in matters of general progress. It admits new members; it controls the budget; it inspects work done and directs future efforts. Because it is very large, and meets only once a year, it places all executive work in the hands of a small Council.

The work of the League spreads over a field as wide as the world itself, touching on almost every matter in which nations are connected with each other, such as money, trade, arms, treaties, health, education, and social problems. They include also the solution of many difficulties left by the Great War.

The settlement of these difficulties, indeed, is the special task of the Council. It guides the affairs of certain European territories whose destinies were bequeathed to it by the Peace Treaties, and it deals with all disputes between nations that

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OURSELVES

may be brought to it. For the rest, it has gathered round it groups of people from all over the world, especially skilled in the various branches, and it collects the results of their work to approve and to pass on to the Assembly. There are at present eight chief permanent groups.

1. Bankers, treasury officials, and ministers of commerce study the best methods in money matters and trade, and apply them whenever opportunity arises.

2. Men of business and commerce are improving the conditions of international trade.

3. Military, naval, and air experts, financiers, economists, employers, and workers tackle the question of reducing armed forces in all countries.

4. Colonial experts guard the interests of the mandated countries (the backward countries entrusted to great nations under a mandate from the League).

5. Medical men are fighting epidemic disease and building up better health conditions.

6. Professors and men of learning seek to unite all brain workers into one vast brotherhood for mutual help and progress.

7. Experts are attacking the widespread evil of the abuse of opium and drugs.

8. Representatives of Governments and voluntary societies unite to urge States to legislate for the safety of unprotected women and children.

The work of the first four groups is mainly devoted to destroying the causes that lead to war, and that of the remainder to building up the spirit of cooperation between peoples in every possible way, but there is no hard and fast division.

Every one of these matters is international. One State cannot go bankrupt without seriously harming others; rivers and railways do not stop at frontiers; infectious diseases sweep over all borders; the culture and learning of the world depend on the contribution of each country; and opium and other dangerous drugs are smuggled from one country to another to cause untold harm.

It is because of its new methods that the League is able to achieve what has not been possible before.

In each subject the necessary information is gathered together and studied and discussed by expert committees. Resolutions are drawn up and passed on to the Council or Assembly, and finally, when approved, they become international undertakings which States agree to carry out.

The work of the committees is continuous. They meet regularly and have always at hand the facts and experience already gathered together. Special Conferences, large or small, can be called with very little trouble, since all the machinery

is there to do it. Council meetings, where results are considered, are almost always open to any one who cares to attend, and if any meeting should be private the minutes are issued.

These three facts—a store of knowledge always available, constant meetings, open discussions—mark the entire difference between League methods and any other methods that have hitherto been tried between nations. That anybody may be present when nations are freely discussing their disputes and difficulties is a tremendous advance on the old system of secret agreements. It means that the world in general, if it cares to, may actually know every decision reached on any matter brought before the Council. *This is an entirely new system to be reckoned with.* So, also, is the condition that no treaty whatever is binding until it has been made public by the League.

The storing of knowledge and the continual consultation are made possible by the existence of the Secretariat.

Here, in its permanent home at Geneva, are the skilled people of many nationalities who work, not for their particular Governments, but for the League, and therefore for all nations. They collect information, prepare documents, and do all the preliminary work necessary for the meetings of the Assembly, the Council, and any other Conferences. They carry out the secretarial work for all branches of the League, with the help of translators and interpreters. The business of the Secretariat includes the following.

It publishes all proceedings.

It supplies information to Governments, to national and international organisations, to the press and the public.

It communicates with Governments and sees to it that the ratification of Treaties and Conventions is not forgotten.

It registers and publishes all treaties.

It controls the money matters of the League.

It deals with legal matters.

It contains a bureau for bringing the far-away States of Central and South America into touch.

It has a rapidly-growing library which aims at containing every publication dealing with the League in any language.

In every department of the League women may hold positions equally with men. English and French are the official languages used, and all documents are published in both.

There are two big and distinct parts of the League which belong to it and receive

THE LEAGUE OF NATIONS

their funds through it, yet which govern themselves and work quite separately.

One of these is the Permanent Court of International Justice. This is a Court of Judges chosen from all over the world to decide matters of dispute between nations. It is a court of law, not of arbitration; questions are decided entirely on legal principles, and strict justice may be expected from it without regard to the importance of the countries concerned. As no code of international law yet exists, decisions must be based on treaties, conventions, international custom, and on general principles of law recognised by civilised nations. These decisions will in time serve to make the laws between nations more definite, and will encourage the making of new laws where necessary.

The Court is open to all States. It has its own definite rules to follow, no matter what State applies or what question is put before it. A clause stating that disputes must be decided by the Court finds its way into almost every new treaty.

The Court is permanent, and has its home at The Hague, where it meets regularly in June, or at other times as needed.

The other distinct part of the League is the International Labour Organisation, which is of the highest importance.

Binding all together in one great whole is the Covenant of the League. This it is

which lays down the lines along which the League must work, and this is the pact to which, by solemn oath, all the States which are members of the League must swear to be loyal.

Every State which has a Representative Government of its own may join the League. It must guarantee its sincere intention of carrying out its international obligations, and must accept the regulations of the League with regard to its armed forces. It may withdraw from the League after two years notice, and it may also be expelled for breaking the Covenant. On the loyalty of its members the life of the League depends.

The vast machinery of the League is designed for three main purposes.

1. The settlement of disputes.
2. The removal of the causes of disputes.
3. The building-up of a system of cooperation by which nations, working together, may lessen the suffering of the world and increase its progress.

The machinery is constructed as simply as may be. Its various parts act and interact with each other, and now, after the four years in which it has been gradually put together, it is working smoothly and efficiently. It has been truly said that the day will come when it will be the mark of an ignorant educated man not to know annually what the League is doing. We should like to see that day.

GUARDING THE PEACE OF THE WORLD

The record of each passing year can only be fully appreciated when the ground plan of the League is understood. Let us look at it.

Articles numbered 10 to 17 of the Covenant require certain pledges from all Member-States. They are these:

To consider any war or threat of war, however far away, as a matter which concerns every State within the League.

To recognise that each State has the right to call the attention of the League to anything whatever which seems likely to disturb the peace of the world.

Not to interfere with other States.

To protect States from outside interference.

To place any serious dispute either before arbitrators, before the Court, or before the Council or Assembly for settlement.

To abide in all cases by the decision of arbitrators or judges.

Not to go to war in any circumstances against a unanimous decision of the Council (not counting the vote of the State in question).

In no case to go to war within three months after the decision, which itself must be made within six months.

To share in a blockade against any nation which goes to war in defiance of a unanimous decision or against the decision of judges, by cutting off all relations with it.

A number of disputes have been brought before the Council and the Court, and most of them have been peacefully settled. When complete agreement has not been reached, at least there has been no resort to war. Three cases will serve as examples.

Sweden and Finland disagreed over the possession of the Aaland Islands. Finland claimed them as a sovereign inheritance, but Sweden claimed them because the inhabitants are Swedish in race and language, and were said to desire to belong to Sweden. Great Britain used her friendly right to bring the matter to the League, as a question likely to cause serious trouble. The Council arranged a visit of inspection to both countries and to the islands. A full report was brought back, considered by the Council, and discussed with representatives of the three places

concerned ; and the decision was given in favour of Finland. But the Council made strict provision that the islands should be kept neutral and non-military, guaranteed by agreement with all the surrounding States, and that the inhabitants should in a large measure govern themselves. The decision was loyally accepted by all.

Serbian troops had invaded Albania, and the Council was asked to meet immediately to decide whether this was a case in which the blockade should be applied. The effect was instantaneous. The value of Serbian money dropped sharply, loan negotiations which were in progress ceased abruptly, and the troops were at once withdrawn, and Albania was left in peace.

Memel, the port on the Baltic Sea which was taken from Germany by the Peace Treaties and given to the new State of

Lithuania, which needed an outlet, had been the subject of prolonged dispute. Its river, the Niemen, is of international importance, and the rights of Poland and of the inhabitants of the territory immediately surrounding the port had to be considered. The Ambassadors' Conference, after prolonged efforts, were quite unable to reach an acceptable solution of the problem, and it was handed to the League Council. A group of men was appointed to investigate the whole matter, they visited the capitals of Lithuania and Poland, and in three months they drew up terms of settlement which were accepted by all.

These terms place the Memel territory under the sovereignty of Lithuania, with rights of democratic self-government, and establish the port as international with through traffic open to all.

THE GREAT BRANCHES OF THE LEAGUE'S WORK

The machinery designed to destroy causes which lead to disputes covers a very large field. The Great War left behind it an increase of armed forces, deplorable conditions of money and trade, territories in Asia and Africa without rulers, and centres of restless agitation in Europe—all situations capable of re-kindling the flame of war. To meet these situations effectively, in its policy of peace and progress, the League, in addition to the Permanent Court of Justice and the International Labour Office, has created the branches we will now consider. The general work is divided among six main committees. The first deals with law and constitution ; the second with transit, health, finance, and economics ; the third with armaments ; the fourth with the League's Budget ; the fifth with social, moral, and humanitarian questions ; and the sixth with political questions.

Disarmament

The Covenant ordains that the Council shall draw up plans for reducing the possession and manufacture of weapons of war, and the number of armed forces, and shall persuade Governments to agree. It is an extremely difficult task. There are national armaments to be considered and arms privately manufactured. There are the industries that can be utilised for munition factories. There is the whole range of poisonous gases. And, most important and difficult of all, there is the question of what military, naval, and air

forces a country should possess in order to secure its safety. No nation would consent to reduce any of these unless all others reduce on the same scale, and unless mutual aid is guaranteed.

Continuous work on every point has been done. Conventions are being studied, and proposals examined on the other important aspects of the problem whose solution depends so much on the dying down of suspicion and unfriendliness.

Money

One of the League's first acts was to call a world Conference to consider what could be done to improve the terrible state into which Europe had fallen in regard to money and trade. Out of this Conference grew a branch of the League entrusted with this special task, under the direct guidance of the Council. Its great achievement has been the remarkable progress of its reconstruction scheme for Austria, and it is now engaged on the same valuable service for Hungary.

As a consequence of the war, Austria lost a large part of her former territory. This and other causes had the result of reducing her food supplies, throwing a large number of officials out of work, and causing general and acute confusion. Food had to be brought from outside, and money was constantly paid away with none coming in return. Other countries lost confidence in her ability to continue paying for goods, and then her money dropped greatly in value. Prices rose, wages could not be

increased to meet them, work failed, and people were on the brink of starvation. Appeals were made everywhere to "save the children," and generous people and societies poured out money in response. Governments lent large sums, but it was all spent in supplying each day's demands. Nothing was done to build up trade, and the country grew poorer and poorer, until it was at last faced with utter ruin. Tens of millions of pounds had been spent by other countries during the course of three years in efforts to help her, and at the end she was in a worse state than ever.

Then her case came before the League. Experts had already been sent to Vienna to study the matter, and *within five weeks* a scheme was drawn up, signed, and launched, which has proved an unqualified success. Austria was required to carry out certain reforms—an increase of taxation; a drastic reduction of unnecessary public officials; an increase in railway charges, which had not been raised in accordance with the changed money-value; a cessation of the issue of paper money. For the two years necessary for these reforms money was raised in other countries on the guarantee of governments, which granted it entirely on the strength of the League's supervision, and Austria herself is paying for the use of it as an ordinary business proposition. A Commissioner-General (a Dutchman) was appointed by the League to live in Vienna, and, with the help of the government, to superintend the working of the scheme.

A comparison of Austria today, restored to hope and prosperity, with what it was less than two years ago, is sufficient proof of the enormous value of international co-operation which the League makes possible.

The problems of Austria were solved largely by the Financial and Economic branch of the League, and this branch attends also to certain general matters which, if satisfactorily settled, would lead to a much smoother working of international affairs. These matters concern incomes which are taxed twice over and others which are not taxed at all, owing to the owner living in a different country; money which has lost its standard value and needs reform; bills of exchange which come under different laws in different countries, and so cause confusion; and the whole question of public finance.

Trade, of course, is bound up with money matters. Certain Customs formal-

ties are considered to be unnecessary and unfair, and an international conference was called and a Convention drawn up to simplify them. The improvement which ordinary travellers as well as business men will find in the near future is a result of this Convention.

Fair play in international trade, fair treatment of foreign enterprises in any country, and the fair settlement of commercial disputes between people of different nationalities, are also some of the important questions before this branch.

Transit

The communications of the world give rise to an untold number of disputes, of which some may at any time become serious. International trade routes pass through many States, countries may be cut off from free access to the sea, commerce and travel are hampered by unnecessary restrictions, and it is the aim of the Transit Organisation of the League to smooth out these difficulties in some of the following ways.

Rivers and railways running through more than one State to be made unfettered highways for the use of all.

Free access to, and equitable treatment of, commerce in maritime ports.

Electric power to be carried without hindrance across intervening States.

Commercial laws of the air to be strengthened. Passports to be simplified, through tickets issued, and through main trains to be run.

A motor driver's licence to be international.

Wireless problems to be investigated.

Summer time to begin and end on fixed dates for all countries.

The date of Easter to be fixed.

Information is collected from every source; it is carefully investigated, and suggestions are made. These are put together clearly and sent to the Governments of each Member-State for approval or suggestion. From their replies a Convention is drawn up which, when ratified by the Parliaments, becomes an international agreement. In this way communications between countries are becoming more free, and the rules of commerce more just.

Territories Without Rulers

At the close of the war certain German and Turkish possessions not sufficiently developed to stand alone had to be distributed. They were considered to be sacred trusts of Civilisation, and were given into the charge of advanced States

which would protect and govern them on behalf of the League, and help the backward ones to develop. The Covenant declares the general lines to be followed in this trusteeship, and the Mandate Regulations, which guide it in detail, state how the natives are to be treated.

No slavery whatever may be allowed.
 Drink and drugs must be strictly controlled.
 Traffic in arms is forbidden.
 Freedom of religion must be guaranteed.
 Education must be encouraged.
 Native troops may be used only for defence.
 An open door must be maintained for trade and immigration.
 Transit and navigation must be free.

Every year each guardian country must present a report of its trusteeship to the League. Any Member-State has the right to complain if it considers that the trust is being betrayed, and may insist on consideration of the matter by the League. Natives themselves may petition the League, or any individual may bring a serious matter to its notice. The light of public opinion thus shines on what might otherwise be very dark places.

Danger Spots in Europe

Two definite tasks were bequeathed to the League by the Peace Treaties—the administration and protection of Danzig and of the Saar territory, both centres of great unrest.

The River Vistula, which flows through Danzig, is the only outlet Poland has to the sea, and the population of the town is almost entirely German. A rich source of trouble existed there. Danzig was made a free city and placed under the protection of the League, and the Council appointed a High Commissioner to live on the spot and to keep the peace. With his help a reasonable constitution was drawn up, and the rights of both Germans and Poles were set out in a long treaty. A new money system has been established, and various difficulties that have arisen have so far been satisfactorily solved, mainly by the good offices of the High Commissioner and the League Council.

In the Saar Territory the coal mines were transferred to France as compensation for those destroyed in the war, but the 700,000 German inhabitants remained. The Peace Treaty decided that it must be governed by an International Commission appointed by the League, and the League had to do the best it could with an exceedingly difficult problem. The Council

appoints the members of the Commission: a Belgian, a Canadian, a Frenchman, a Spaniard, and a German inhabitant of the territory. They live in the country and govern it, and after a troublesome time, with constant conciliatory measures on the part of the League Council, the scheme is beginning to work more smoothly. In 1935 the people are to vote whether they wish to be ruled again by Germany or by France, or to remain under League control.

Minorities

Groups of people stranded, and sometimes oppressed, in the midst of a nation from which they are different in race, language, or religion, are always likely to be a source of trouble. To guard against this as far as possible, such minorities have been placed under the supervision of the League. Treaties made with the countries in which they are situated contain directions for their protection, and guarantee to them free life, free speech, free religion, and free education. If such treaties should be broken the League is ready to hear the petitions of these minorities, or any protest made by an outside Power. There is also the Permanent Court of Justice to which application can be made, and in certain disputes it is obligatory; but the threat of publicity will usually be sufficient to secure justice. Nations like to stand well in the eyes of others.

Health

The branch set apart in accordance with the Covenant for the purpose of taking "steps in matters of international concern for the prevention and control of disease" is the Health Organisation.

It seeks means for stamping out diseases that spread from one country to another.

It helps to improve sanitary and general health conditions by arranging courses of study for medical men in various countries.

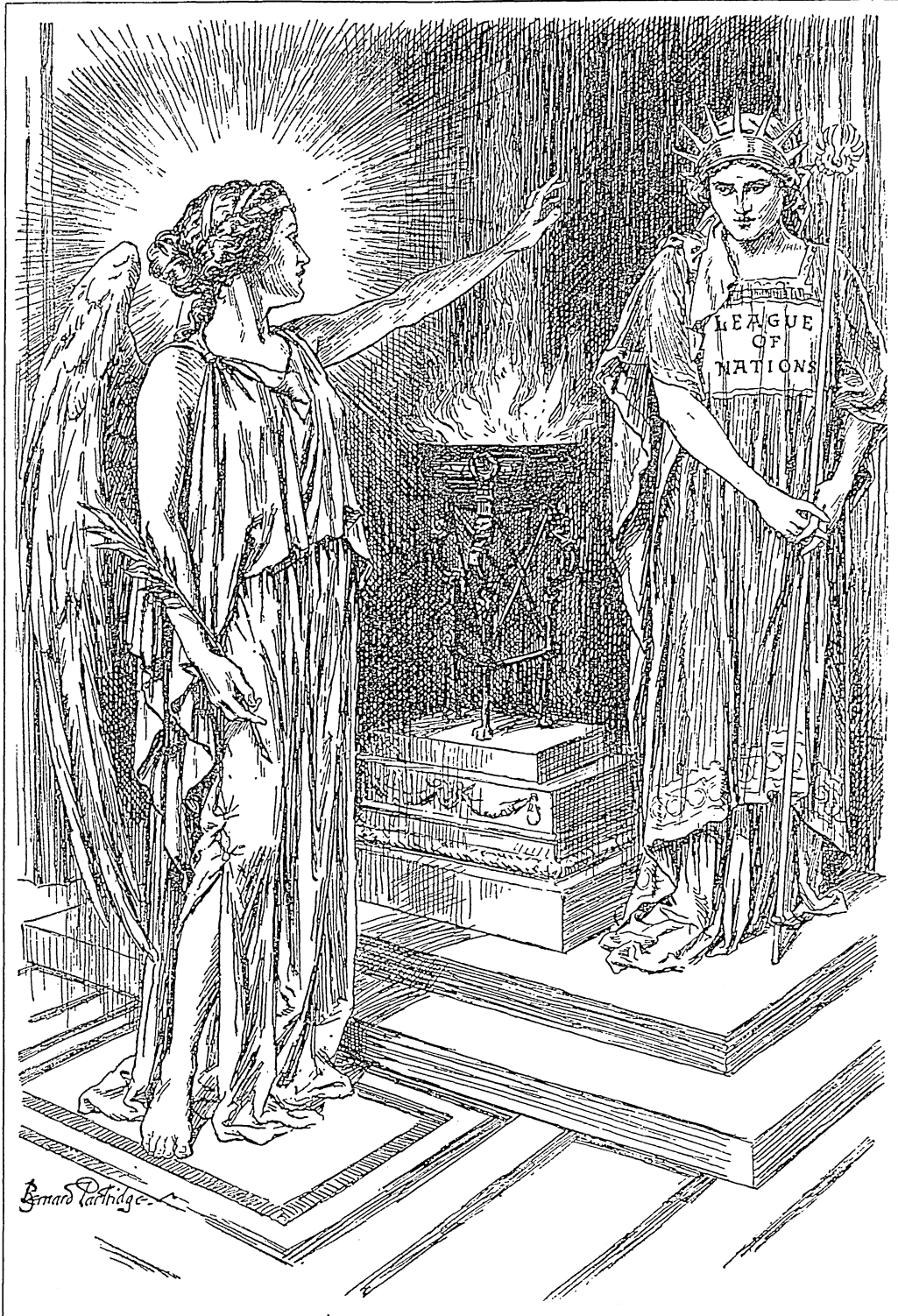
It organises a system of travelling medical scholarships for health officers wishing to study some special subject.

It aims at a uniform international system for measuring, testing, and naming anti-toxins.

It pursues inquiries into malaria, into sleeping sickness and tuberculosis in Africa, and into cancer everywhere, which will greatly aid in the struggle against these diseases.

All its investigations are carried out by medical men from many countries, and the whole scheme is a great effort towards working together for good.

PEACE AND HER TEMPLE



PEACE: THIS IS MY TEMPLE AND YOU ARE ITS PRIESTESS. GUARD WELL THE SACRED FLAME

This splendid cartoon is one of Punch's many contributions to the cause of the League of Nations

Of immense value was the work of the Epidemics Commission in fighting the spread of disease from the famine-stricken areas of Russia across the border into western Europe. To its hands was entrusted the provision of hospitals, sanitary equipment, and food, and the whole continent has reason to be grateful that its effective measures checked what might have been a terrible scourge.

Secret Treaties

In future, by the terms of the Covenant, all treaties between nations must be registered with the Secretariat of the League. They are then to be published for all the world to read, and copies will

be supplied to any State or person who may ask for them. *The strength and value of this statement of the Covenant lie in the fact that it adds that no treaty shall be binding unless it has been registered in this way.* Nations which have signed the Covenant are in honour bound to make no more secret agreements in future, the cause of so much trouble in the past.

To settle disputes and to destroy causes which lead to them is part of a programme which can only be completed by definite efforts towards universal cooperation in all matters affecting the welfare of mankind. Along the broad lines of health, education, and social problems, treated internationally, the League is steadily working.

THE INTELLECTUAL LIFE OF THE WORLD

The great aim of this branch is to unite scholars, thinkers, and writers of all nationalities into one great brotherhood, so that they may enlarge and strengthen the spirit of mutual understanding, and may spread from one country to another ideas which can ensure peace among the peoples. To this end the Committee on Intellectual Cooperation urges all Governments to encourage the teaching of modern languages, to increase courses on the study of modern nations, and to facilitate exchange of professors and students.

It has made a very full enquiry into the present state of the intellectual life of the world, in order to draw attention to those countries in which help is urgently needed and so paving the way for gifts and loans of books, instruments, and so on. The war and the troublous times following it has made it extremely difficult for new countries, and for countries with money troubles, to carry on higher education. Writers and scientists who have been utterly unable to produce their works

will now be aided by the more fortunate countries and put in touch with publishers and periodicals. They will find great help, too, from the Committee's work in bibliography, the collecting of titles, and summaries of up-to-date scientific books and journals, which are absolutely necessary for modern research.

The question of establishing copyright laws for scientific inventions and discoveries is being thoroughly investigated, and it is hoped that in the near future scientists may have their original work legally protected in the same way as that of writers and industrial inventors.

By means of its secretarial office the committee is bringing universities into closer touch with each other, and is gradually accumulating a common fund of knowledge, methods, and discoveries on which all may draw. It does this through the centres which it has helped to establish in various countries to act as connecting links between the League and all higher educational institutions.

SOCIAL AND MORAL PROBLEMS

To lessen some of the ills of an international kind which affect certain groups of people is the aim of still another branch of the League. One part of it strives to safeguard women and children from evils that may befall them in passing from one country to another. It is able to do this with the help of voluntary associations which for a long time past have led the way, and it adds to their work the advantage of dealing directly with Governments. It urges on Governments that they should put into more regular practice certain

Conventions drawn up for the better protection of emigrants and the sterner punishment of offenders. It also urges the great value of the work of women police.

Connected with this is the continued fight against the publication of offensive pictures and papers.

Another part of this branch is concerned with the control of the use of opium, morphine, and cocaine. Countries are closely inter-connected with this problem, some growing poppies, some preparing

THE LEAGUE OF NATIONS

opium, some manufacturing drugs. Because the abuse of drugs is dangerous it was decided some time ago to control the trade, but as big profits can be made smuggling is constantly practised.

The League has taken up the question and is trying to ensure that this agreement should be more faithfully carried out. Two plans are under consideration :

To reduce the manufacture of drugs to the amount needed for medicine and science.

To cut down the cultivation of poppies

With the help of this branch devoted to social and humane problems, the League has done an enormous amount to lessen some of the suffering caused by the war. Societies of every kind were doing their

best, but it needed the League to join all their efforts together and thus to make them successful in a way which was not possible separately.

Nearly half a million prisoners of war who were suffering intensely, and were likely to die, were returned to their homes.

Uncounted refugees from Russia, Asia Minor, Armenia, and other places, have been helped with food, shelter, and work.

Many thousands of these refugees have been aided to emigrate to countries where there is room for them.

A settlement is thriving in Greece where refugee men and women have become self-supporting, thanks to the League, and its power of obtaining loans.

Large numbers of women and children who had been captured in the Near East, and taken away, were returned to their homes.

THE CHEAPEST ORGANISATION IN THE WORLD

In all its work the League makes use of existing organisations wherever possible. Some have been taken over as a whole and their possibilities enormously increased by the fact that the League is a union of Governments, and so able to achieve what is not possible for other organisations.

International Government Bureaus already established may be placed under the League, and in future all are to be under its direction.

In this way the League preserves and incorporates all that has been proved valuable in the past, and uses it to build up a new international life on a definite basis. The services of all possible representative agencies, official or unofficial, are utilised as occasions demand them, but final decisions and actions are the work of the Governments in the League. It rests with them, and with the peoples whose servants they are, to see that the wonderful machinery of the League of Nations is properly used in the wide purposes for which it was brought into being.

The League is the cheapest organisation in the world, considering the vast work it does in an area as wide as the world.

The actual yearly budget of the League, contributed by over fifty States, is about £900,000. Member-States contribute towards this in proportions which have been based on their population and revenue.

The story of how the present apportionment was reached is a long one. The Covenant directs that expenses should be divided in the same proportions as those of the Universal Postal Union, but this

was found to be entirely unsuitable. After a great deal of close study a satisfactory schedule is now in force.

The arrangement is by a system of units, which represent the proportions in which each country pays. Great Britain, for example, is rated at 88 units, Guatemala, Honduras, and Liberia at one unit each. France originally was rated equally with Great Britain, but temporarily a slight reduction is made on account of her devastated areas. Italy and Japan are responsible each for 61 units, and the Dominions are as follows: India 65, Canada 35, Australia 26, South Africa 15, New Zealand 10, Ireland 10. The total number of units is 932. Therefore, Great Britain's share is roughly about £90,000.

The whole annual cost of the League is the price of one modern light cruiser, and Britain's share is the cost of one torpedo destroyer; or, put in another way, Britain's share is *one 8000th part of her annual national budget*.

Each Member-State pays its contribution in a lump sum, and this is then divided between the League proper, including the Secretariat, the Labour Organisation, and the Permanent Court of Justice, the Court receiving about one-sixth, and the Labour Organisation about three-fifths of the total.

These three Budgets are prepared nine months in advance by the directors of each organisation. They are presented to the Supervisory Committee, each item is most carefully scrutinised, and a report is then prepared and sent to the

Governments in ample time for examination before the meeting of the Assembly. Each Member-State therefore knows exactly what its contribution for the coming year will be, and has opportunity to make it public. Payments are reckoned in gold francs, which we may think of roughly as the pre-war value of the franc; but the money the League uses is the Swiss franc. All the money matters of the League are

very strictly controlled. Complete rules and regulations cover every phase of the work, and are enforced by a very efficient system. Accounts are examined and audited regularly and frequently, and full statements of receipts and expenditure are handed to the auditor each month. It is safe to say that no Government exercises stricter control over its financial business than the League of Nations.

THE INTERNATIONAL LABOUR OFFICE

One of the greatest things in the Peace Treaty of Versailles is the Charter of Labour, as the foundation of the International Labour Office has been called. For the first time in the long history of international treaties such words as these occur in this historic document :

Whereas the League of Nations has for its object the establishment of universal peace, and such a peace can be established only if it is based on social justice ;

And whereas conditions of labour exist involving such injustice, hardship, and privation to large numbers of people as to produce unrest so great that the peace and harmony of the world are imperilled ; and an improvement of those conditions is urgently required ;

Whereas also the failure of any nation to adopt humane conditions of labour is an obstacle in the way of other nations which desire to improve the conditions in their own countries :

The High Contracting Parties, moved by sentiments of justice and humanity as well as by the desire to secure the permanent peace of the world, agree . . .

Then are set out the principles which are to guide the I.L.O. in its work.

The chief aim is to make conditions of work all over the world as nearly alike as possible. The need for this lies in the fact that long hours and poor pay in one country lower the standards in another, and it is only by keeping them on a fairly equal level, having regard to climate, custom and circumstances, that such evils as sweating and unfair competition can be prevented.

The organisation is steadily and continuously working towards this object by urging on all nations a number of measures calculated to improve the lot of working men and women. These are some of the ideas in the wide field that they cover :

That hours of work may be limited.

That wages provide a reasonable standard of life according to time and country.

That men and women may receive equal pay for equal work.

That the evils of unemployment may be remedied as far as possible.

That a weekly rest day may be adopted.

That in every country a system of adequate factory inspection, by women as well as men, may be set up.

That women and young people may be safeguarded in many ways.

That child-labour may be abolished.

That opportunities may be increased for young people to carry on their education.

That working people may be free to form their own associations.

That the health of workers may be protected.

That workers may be insured against old age, and against sickness or injury arising from work.

That the interests of emigrants and people working in foreign lands may be safeguarded.

That the welfare of seamen, as they pass to and fro across the world, may be promoted.

That those disabled by war or accident everywhere may be aided by all experience gained in the manufacture of artificial limbs, and so on.

Such is the splendid list of aims and ideals which is set before the Labour Office. That it does not remain in the realm of unattained ideals is shown by the number of draft Conventions and recommendations already drawn up.

Draft Conventions consist of regulations concerning a particular subject which every State ratifying it undertakes to observe.

Recommendations are offered to States as suggested guides to national laws.

These are all drawn up by the great yearly Conference, and must receive a two-thirds vote. Then each Member-State is pledged to place them before its Parliament within one year. Whether they become national law or not, the fact that they are backed by most of the nations of the world gives them great weight, and they cannot easily be neglected.

Sixteen Draft Conventions have been drawn up and twenty Recommendations offered. In the case of the Conventions, 125 ratifications have been obtained from States, which means that in 125 cases

certain States have pledged themselves to follow fully, in their national laws, the regulations laid down in the Conventions adopted by the Conference. Also, 181 legislative measures, such as Acts of Parliament, have been adopted or prepared with a view to the application of the Conventions and Recommendations.

Of still greater importance is the fact that in a very large number of instances, when the Governments have found it impossible actually to ratify, the Conventions have been taken as a model to be followed in making or altering laws.

The subjects that have thus been dealt with including the following:

The limiting of hours of work in industrial undertakings, fishing industry, and navigation.

Unemployment, particularly in agriculture.

The establishment of public Health Services.

Factory inspection.

The employment of mothers whose babies need their care and attention.

The minimum working age of children.

The night work of women and young people in industry and agriculture.

The welfare of seamen in regard to unemployment, insurance, codes, and medical examination.

Equal treatment of foreign workers.

Protection against industrial diseases such as anthrax, and lead, and phosphorous poisoning.

A weekly rest day.

Agricultural conditions.

Such is the work achieved in a few years by this International Labour Office.

In addition to helping forward labour legislation in this way, a centre has become established where knowledge and experience is constantly being stored up for the service of any who require it. New States have already greatly benefited by this, and others frequently make use of it, in improving their labour conditions. A new Factory Act in India, new and drastic laws in Japan and China, improvement in work conditions in Persia, are due entirely to the efforts of the

I.L.O., quite apart from the conventions which it has succeeded in building into the framework of international law.

The International Labour Office forms part of the League of Nations. Its members are those States which are members of the League, and Germany, Ecuador, and the Hejaz, who are still outside the League. Except for this connection, and, except that it draws its funds through the League, it governs itself. Its home is at Geneva, where temporary buildings are used while a larger permanent one is being constructed.

The General Conference is its yearly Assembly. To it each Member-State may send two representatives of its Government, and one each of its employers and workers, together with technical advisers.

A smaller Governing Body composed in the same way, but of 24 members in all, meets every three months.

The Labour Office has charge of all the secretarial work. It has three departments:

1. The Diplomatic Division, which organises and prepares all work for conferences and conducts official correspondence with Governments.

2. The Intelligence Division, which collects and distributes information.

3. The Research Division, which carries out scientific studies and inquiries.

Working with these divisions are the sections, in charge of trained experts, which deal with the following subjects:

Unemployment; Social Insurance and Disablement; Agriculture; Cooperation; Industrial Hygiene; Emigration.

The I.L.O. takes its part in many activities of the League. It is represented on every Committee in which its particular knowledge and experience is of value, and it is always asked to assist in any work directly connected with human beings. It is closely in touch with the League at all times.

THE LEAGUE AS A PRACTICAL THING

It will be seen from this epitome of the work and purposes of the League that it covers a much wider field than most people imagine, and its work is of an intensely practical kind. Its achievements have been considerable in many spheres of influence, but even in its most difficult sphere, and in its most difficult years, the League built up a great reputation.

Those who believe that the League is a mere experiment will be surprised by the record of work accomplished in its opening

years, the most anxious time for any new movement. Here is a record of its work during the first four and a half years of its existence.

The following international disputes were solved to the satisfaction of all parties:

1. The dispute for the possession of the Aaland Islands peacefully settled.

2. Fighting between Poland and Lithuania over Vilna prevented.

3. The division of Upper Silesia between Poles and Germans finally arranged.

OURSELVES

4. The Serbian invasion of Albania stopped.
5. Unrest from Bulgarian border raids quieted.
6. Practical suggestions offered and accepted in the crisis between Italy and Greece.
7. Satisfactory arrangements made for the port of Memel.

8. Frontier lines peacefully marked out between Austria and Hungary; Hungary and Czecho-Slovakia; Czecho-Slovakia and Poland. Among the administrative, financial, and economic achievements of these first years were these.

1. Loans raised for Austria, Hungary, Greece.
2. The government of Danzig settled and a new currency established.
3. The government of the Saar Territory kept under constant supervision.
4. Austria saved from ruin by a scheme of financial reconstruction.
5. A Financial Adviser appointed for Albania.
6. Financial reconstruction of Hungary.
7. Many questions settled arising from alteration made by the Peace treaties in various boundaries, including the rights of German settlers in Poland and Hungarian landowners in Rumania, and the treatment of Bulgarians and Albanians in Greece.
8. Certain minority questions settled in Hungary and Lithuania.

Among the international Conventions drawn up were these, many of which were signed and ratified at once.

Simplification of Customs.

Insertion of Arbitration Clauses in Commercial Contracts.

International Control of Navigable Waterways.

International Control of Railways.

Freedom of Transit.

Maritime Ports.

Transmission in Transit of Electric Power.

Development of Hydraulic Power on Rivers.

Suppression of Traffic in Women and Children.

Suppression of Offensive Publications.

The social and humanitarian activities of the League embraced such cases as these.

Epidemics of typhus in Poland and on Russian borders checked.

Nearly half a million prisoners-of-war returned to their homes.

Deported women and children in the Near East rescued.

Armenian, Greek, and Turkish refugees in Asia Minor helped.

Continued work towards settling two million scattered Russian refugees.

A self-supporting refugee settlement established in Greece.

Relief organised for the famine in Albania.

Cases have come before the Permanent Court of Justice dealing with the following subjects, and have all been settled.

Questions on the constitutional organisations of the League.

France v. Britain on nationality decrees in Tunis and Morocco.

Finland v. Russia on matters concerning Eastern Carelia.

Poland v. Germany on minorities of German origin in Poland.

Poland v. Czecho-Slovakia on the Jaworzyna frontier.

Allied Powers v. Germany on the right of S.S. Wimbledon to pass through the Kiel Canal.

Greece v. Britain on pre-war concessions to a Greek subject in Palestine.

Albania v. Yugo-Slavia on the frontier question at St. Naoum.

Dispute between Greece and Bulgaria.

In addition, over 600 International Agreements were deposited with the League and published to the world before the League was five years old.

The following publications of the League are available for all who apply to the League for them.

Official Journal, Monthly Summary, and descriptive pamphlets.

Monthly Bulletin of Financial Statistics.

Studies on banking, currency, and exchange.

Statistical Year Book of Military Information.

Quarterly Bulletin of International University Information.

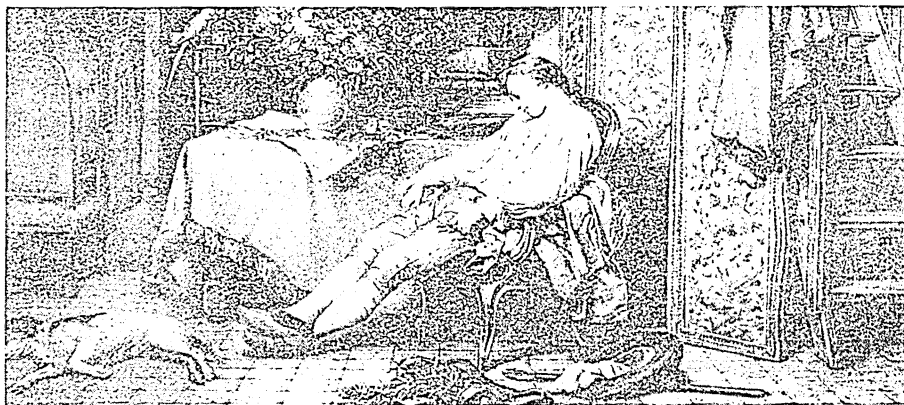
Pamphlets describing the present intellectual life of the world.

Assembly Proceedings.

These lists touch the League's work very briefly, but it suggests the various fields of power that are open to its influence. A mere glance at the Covenant of the League is enough to satisfy the most critical that the League has an immense possibility before it, apart from the question of war. A copy of the Covenant of the League can be obtained from the Secretary of the League of Nations at Geneva, or from the League of Nations Union in London. It has 26 articles. The first seven and the last deal with the constitution and organisation of the League; 8 and 9 with directions as to the reduction of armaments; 10 to 17 with the settlement of disputes and institution of court and penalties; 18 to 21 with the registration of treaties and their construction; 22 with mandates for the administration of backward countries; 23 with labour, transit, health, and social questions; 24 with the affiliation of international bureaux; 25 with the promotion of Red Cross work.

Such is the beginning of the greatest political idea that has yet entered into the region of practical human affairs. All good people hope it will succeed; all hopeful people believe it will succeed. It is the great hope of mankind.

The Story of the Marvellous Plants that Cover the Earth



The great botanist Linnaeus resting in his study

PLANT FAMILIES

THE number of different plants in the world is so enormous that some sort of grouping is necessary if we are to understand them and know their relationship to one another.

There is no doubt that the very earliest grouping was according to the uses of the plants; these were good for food for men and those for food for cattle; these were useful as medicines and those for clothing. But the Greek and Roman scholars were not satisfied with such a rough-and-ready, unscientific grouping, and, taking into consideration the various facts which had been learned about plants, they divided them into trees, shrubs, and herbs.

This was Aristotle's method of grouping, and nothing more was done till the sixteenth and seventeenth centuries, when John Ray, "the father of English natural history," divided all plants into two groups, the flowering and the flowerless. He further divided the flowering plants into two divisions which he called monocotyledons and dicotyledons. A cotyledon is the seed lobe, or rudimentary leaf, of the embryo of a plant, seen very clearly when a bean seedling rises above the ground lifting the bean with it. The outer coat slips off, and the two thick parts which spread farther and farther apart, showing between them young green leaves, are the cotyledons. Well, Ray divided the flower-

ing plants into those which have one cotyledon, such as the buttercup and primrose, and those which have two like the bluebell and crocus.

This was really a great step forward, and other botanists continued the good work until the time of Linnaeus. Karl von Linné, which was the real name of this great Swedish botanist, introduced a system of classification based on the stamens and pistils of the plants, and although this has now been superseded it had an influence on all future botany which cannot be overestimated. Linnaeus, indeed, showed the way in what was really a scientific wilderness, and he has well-earned the title of "the father of modern botany." It has been said of him that he was born a botanist, and at the age of four he astonished his father and the guests of a garden party by listening with rapt attention to a discussion on the names and properties of plants. In those days all who attended a garden party were supposed to show some intelligent interest in the flowers.

When he grew up Linnaeus became the greatest botanist of his day, and he made the science intelligible by laying down the principle that every plant (and every animal, too) should have a short name which would enable it to be recognised by investigators all over the world. We

BOTANY & ITS WONDERS · FLOWERS · TREES · HOW THINGS GROW

ought to understand what a tremendous thing this was in the history of science. Without it science could never have gone forward as rapidly as it has. Scholars would have been weighed down by the clumsy and ponderous methods of describing their discoveries which prevailed before the days of Linnaeus.

THE WONDERFUL THING THAT LINNAEUS DID FOR SCIENCE

Up to the time of Linnaeus botanists had only one Latin name for each group of plants. All roses, for example, were called *Rosa*, but when it became necessary to distinguish between the many different kinds of roses the greatest confusion existed. If a man wanted to name a particular variety of rose he would call it *rosa* and then go on to give a long description, also in Latin. Thus the common dog rose was spoken of as *rosa sylvestris vulgaris flore odorato incarnato*, which means the common rose of the woods with a flesh-coloured sweet-scented flower. Think what it would mean today when we studied botany if everyone of the 176,000 known species of plants in the world had as long a name as the one mentioned above.

Linnaeus changed all that. He set himself the amazing task of giving to every known plant and animal a simple name consisting of two Latin words, and he did it. Science today blesses and honours his name for this great, epoch-marking work. He was one of the world's greatest inventors, for this idea of distinguishing every living creature by two Latin words so that students all over the world should recognise it, was as great an invention as the locomotive or telephone.

THE NATURAL AND ARTIFICIAL WAYS OF GROUPING PLANTS TOGETHER

To the different plants and animals that had certain family characteristics in common Linnaeus gave a name known as a generic name, and then to distinguish the various members of the family he gave a second name called a specific name. After grouping the plants according to the number and arrangement of their stamens and pistils—the pollen-bearing and seed-bearing parts of the plants—he subdivided the various groups according to the character and appearance of the leaves and stems of the plants, and his descriptions were so accurate that anyone finding a plant anywhere in the world could easily identify it or know whether he had discovered a new plant.

The weakness of this method of classification was that it brought together into one group plants that had no real relationship. It was as though we classed people according to the colour or curliness of their hair or the shapes of their noses. Such a system would enable us to identify individuals, but it would not enable us to group them according to their families.

The natural system now followed in classifying plants takes into consideration their form, functions, and development. The whole vegetable kingdom is divided into four sub-kingdoms. First we have the lowest in the scale, the *Thallophyta*, or *thallophytes*, which includes the *Algae*, blue-green, green, brown, and red, the slime moulds, the bacteria, the yeasts, and other fungi. Many of these plants are microscopic in size. Their chief characteristic is that each plant consists of a *thallus*, that is a simple plant not divided into root, stem, and leaves.

THE DIFFERENT WAYS IN WHICH PLANTS PRODUCE SEEDS

Then comes the second sub-kingdom, the *Bryophyta*, a word which means moss-plants. This sub-kingdom includes the liver-worts and the mosses. The third sub-kingdom is the *Pteridophyta*, a word which means the fern plants. It includes the ferns, the horsetails, the club-mosses, and the quill-worts. The fourth and highest sub-kingdom is that of the *Spermatophyta*, or *spermatophytes*. This name means seed plants and includes all the plants which produce seeds. There are two great distinctions in the seeds of seed-bearing plants. Some are formed on the outside of the modified leaf known as a *sporophyll*, or seed-leaf. The others are enclosed in a pod-like or sac-like structure formed by the infolding of the *sporophyll*. The whole sub-kingdom of the *spermatophytes*, or seed-bearing plants, is therefore divided into two great divisions, known as the *Gymnosperms* (a word meaning naked seeds) which includes the cone-bearing plants like the pine and larch; and the *Angiosperms* (meaning seeds in vessels) which includes the great majority of the seed plants now living.

The *Angiosperms* are again sub-divided into two classes, the *Dicotyledons* and the *Monocotyledons*, according to whether their seeds have one or two cotyledons. Then the *Dicotyledons* are further divided into two sub-classes. Those that have free petals in one or two whorls like the

PLANT FAMILIES

buttercup and daisy are placed in one sub-class called the Polypetalae (many-petalled) or Archichlamydeae, a name made up of two Greek words meaning the beginning of a mantle. The flowers that have their petals joined together by their edges like the bluebell and crocus are placed in the second sub-class called variously the Sympetalae (petals together), or the Monopetalae (one-petalled), or the Gamopetalae (united petals).

The sub-classes are further divided into series, the series into orders or families, the orders into genera, and the genera into species. We thus get the whole of the plants of the world divided up, the Kingdom embracing all plants, and the last sub-division (the species) including particular individuals.

The order of grouping is like this :

VEGETABLE KINGDOM

SUB-KINGDOMS

DIVISIONS

CLASSES

SUB-CLASSES

SERIES

ORDERS OR FAMILIES

GENERA

SPECIES

It is impossible here to give anything like a classification of all the genera and

species, or even of the orders of the plants of the world. It would take up far too much space and would be uninteresting except to advanced students of botany. To give a complete grouping even of the flowering plants of the British Isles would also occupy too much space, but we may show how some of the better known or more important of these British wild plants are classified by botanists, and we shall probably be surprised to see how closely related to one another are some plants that seem widely different in character and appearance. It must be borne in mind that the various species in a genus are sister plants, whereas the plants of different genera in an order or family are, as it were, cousins.

In the following pages all the British genera of flowering plants are given under their natural orders, or families, and many of the species into which these genera are divided are indicated in brackets after the names of the genera. Genera is, of course, the plural of the word genus.

First of all, then, we take the class of Dicotyledons, and begin with the subclass of Polypetalae. In this the first series is the Thalamiflorae, in which the stamens are below the pistil, and the series contains the following 21 natural orders, or families :

THE 93 ORDERS OF BRITISH PLANTS

FIRST ORDER: RANUNCULACEAE—15 GENERA.

1. Clematis; 2. Thalictrum (the meadow-rues); 3. Anemone; 4. Adonis (pheasant's eye); 5. Myosurus (mousetail); 6. Ranunculus (the crowfoots, spearworts, goldilocks, buttercups, and lesser celandine); 7. Caltha (marsh marigold); 8. Trollius (globeflower); 9. Helleborus (hellebores); 10. Eranthis (winter aconite); 11. Aquilegia (columbine); 12. Delphinium (larkspur); 13. Aconitum (monk's-hood); 14. Actaea (baneberry); 15. Paeonia (peony).

SECOND ORDER: BERBERIDEAE—2 GENERA.

1. Berberis (barberry); 2. Epimedium (Alpine barrenwort).

THIRD ORDER: NYMPHAEACEAE—2 GENERA.

1. Nymphaea (the yellow water-lilies); 2. Castalia (white water-lily).

FOURTH ORDER: PAPAVERACEAE—5 GENERA.

1. Papaver (opium poppy, common poppy, rough-headed poppies, smooth-headed poppy); 2. Meconopsis (Welsh poppy); 3. Glaucium (yellow horned poppies); 4. Roemeria (violet horned poppy); 5. Chelidonium (greater celandine).

FIFTH ORDER: FUMARIACEAE—2 GENERA.

1. Neckera (corydalis); 2. Fumaria (the ramping and common fumitories).

SIXTH ORDER: CRUCIFERAE—28 GENERA.

1. Matthiola (stocks); 2. Cheiranthus (wall-flower); 3. Nasturtium (watercress and yellow cress); 4. Barbarea (winter cress); 5. Arabis (the

rock cresses and tower mustards); 6. Cardamine (bitter cresses, lady's smock, and coral root); 7. Hesperis (dame's violet); 8. Sisymbrium (hedge mustard, wall cress, flaxweed, London rocket, and jack-by-the-hedge); 9. Erysimum (the treacle-mustards); 10. Brassica (the cabbages and mustards); 11. Diplotaxis (wall rocket and sand rocket); 12. Alyssum; 13. Draba (the whitlow grasses); 14. Erophila (long and short-podded whitlow grasses); 15. Cochlearia (the scurvy grasses and horse-radish); 16. Camelina sativa (gold of pleasure); 17. Subularia (awl-wort); 18. Bursa (shepherd's purse); 19. Coronopus (the wart cresses); 20. Lepidium (the pepperworts and common cress); 21. Thlaspi (the penny cresses); 22. Iberis (candy-tuft); 23. Teesdalia; 24. Hutchinsia; 25. Isatis (woad); 26. Crambe (sea-kale); 27. Cakile (sea rocket); 28. Raphanus (the radishes).

SEVENTH ORDER: RESEDACEAE—1 GENUS.

1. Reseda (mignonette, dyer's rocket or yellow-weed, and shrubby rocket).

EIGHTH ORDER: CISTINEAE—1 GENUS.

1. Helianthemum (rock-rose).

NINTH ORDER: VIOLACEAE—1 GENUS.

1. Viola (the violets and pansies).

TENTH ORDER: POLYGALACEAE—1 GENUS.

1. Polygala (the milkworts).

11TH ORDER: FRANKENIACEAE—1 GENUS.

1. Frankenia (sea-heath).

PLANT LIFE

12TH ORDER: CARYOPHYLLACEAE—12 GENERA.

1. Dianthus (the pinks); 2. Saponaria (soapwort); 3. Silene (most of the campions and catchflies); 4. Lychnis (evening campion, red campion, alpine campion, ragged robin, German catchfly, and corn-cockle); 5. Holosteum (jagged chickweeds); 6. Cerastium (mouse-ear chickweeds and alpine stitchwort); 7. Stellaria (great chickweed, common chickweed, perennial chickweed, and the greater, lesser, bog, marsh, and wood stitchworts); 8. Arenaria (the sandworts and sea purslane); 9. Sagina (the pearl-worts and knotted spurrey); 10. Spargula (corn spurrey); 11. Buda (the sandwort spurreys); 12. Polycarpon (all-seed).

13TH ORDER: PORTULACACEAE—2 GENERA.

1. Claytonia; 2. Montia (water blinks).

14TH ORDER: TAMARISCINEAE—1 GENUS.

1. Tamarix (tamarisk).

15TH ORDER: ELATINEAE—1 GENUS.

1. Elatine (water-wort).

16TH ORDER: HYPERICINEAE—1 GENUS.

1. Hypericum (tutsan, and the St. John's-worts).

17TH ORDER: MALVACEAE—3 GENERA.

1. Althea (the marsh mallows); 2. Lavatera (the tree-mallows); 3. Malva (musk, common, and dwarf mallows).

18TH ORDER: TILIACEAE—1 GENUS

1. Tilia (the limes or lindens).

19TH ORDER: LINEAE—2 GENERA.

1. Radiola (flax-seed); 2. Linum (the flaxes).

20TH ORDER: GERANIACEAE—4 GENERA.

1. Geranium (the crane's-bills and herb robert); 2. Erodium (the stork's bills); 3. Oxalis (wood-sorrel); 4. Impatiens (balsams and touch-me-not).

21ST ORDER: ILICINEAE—1 GENUS.

1. Ilex (holly).

The second series of the sub-class of Polypetalae is the Calyciflorae, and this contains the following 15 orders:

22ND ORDER: CELASTRINEAE—1 GENUS.

1. Euonymus (spindle-tree).

23RD ORDER: RHAMNEAE—1 GENUS.

1. Rhamnus (the common and alder buckthorns).

24TH ORDER: ACERINEAE—1 GENUS.

1. Acer (common maple and sycamore).

25TH ORDER: LEGUMINOSAE—17 GENERA.

1. Genista (needle whin, and the green weeds); 2. Ulex (the furzes); 3. Cytisus (broom); 4. Ononis (the rest-harrows); 5. Trigonella (fenu-greek); 6. Medicago (lucerne and the medicks); 7. Melilotus (the mellilots); 8. Trifolium (the clovers and trefoils); 9. Anthyllis (lady's fingers); 10. Lotus (the bird's-foot trefol's); 11. Astragalus (the milk-vetches); 12. Oxytropis; 13. Ornithopus (bird's-foot and sand joint-vetch); 14. Hippocrepis (tufted horse-shoe vetch); 15. Onobrychis (sainfoin); 16. Vicia (the vetches and hairy, smooth, and slender tares); 17. Lathyrus (the vetchlings, bitter vetch, and everlasting peas).

26TH ORDER: ROSACEAE—14 GENERA.

1. Prunus (blackthorn, bullace, plum, and cherries); 2. Spiraea (spiraea, meadow-sweet, and dropwort); 3. Rubus (raspberry, blackberry, dew-

berry, and cloudberry); 4. Dryas (mountain avens); 5. Geum (common and water avens); 6. Fragaria (strawberry); 7. Potentilla (barren strawberry, tormentil, silver-weed, cinque-foils, and sibbaldia); 8. Alchemilla (the lady's mantles); 9. Agrimonia (the agrimonies); 10. Poterium (the salad burnets and great burnet); 11. Rosa (the roses and sweet-briars); 12. Pyrus (wild service, the white beams, mountain ash, pears, apple, and medlar); 13. Crataegus (hawthorn); 14. Cotoneaster.

27TH ORDER: SAXIFRAGEAE—4 GENERA.

1. Saxifraga (18 of the saxifrages including the alpine, marsh, meadow, hairy, mountain, and London pride); 2. Chrysosplenium (the golden saxifrages); 3. Parnassia (grass of Parnassus); 4. Ribes (the currants and gooseberry).

28TH ORDER: CRASSULACEAE—4 GENERA.

1. Tillaea; 2. Cotyledon (pennywort); 3. Sedum (the stonecrops, rose-root, and orpine); 4. Sem-pervivum (houseleek).

29TH ORDER: DROSERACEAE—1 GENUS.

1. Drosera (the sundews).

30TH ORDER: LYTHRARIACEAE—2 GENERA.

1. Peplis (water purslane); 2. Lythrum (common, and hyssop-leaved purple loosestrifes).

31ST ORDER: HALORAGACEAE—3 GENERA.

1. Hippuris (mare's tail); 2. Myriophyllum (the water milfoils); 3. Callitriche (the various water starworts).

32ND ORDER: ONAGRARIACEAE—4 GENERA.

1. Epilabium (the willow herbs); 2. Ludwigia (marsh isnardia); 3. Oenothera (the evening primroses); 4. Circaea (enchanter's nightshade).

33RD ORDER: CUCURBITACEAE—1 GENUS.

1. Bryonia (white bryony).

34TH ORDER: UMBELLIFERAE—41 GENERA.

1. Hydrocotyle (marsh pennywort); 2. Eryngium (sea holly and field eryngo); 3. Astrantia; 4. Sanicula (sanicle); 5. Physospermum (bladder-seed); 6. Conium (hemlock); 7. Smyrnium (common Alexanders); 8. Bupleurum (hare's ear and the buplevers); 9. Trinia (honestwort); 10. Apium (wild celery and marshwort); 11. Cicuta (water-hemlock); 12. Ammi; 13. Carum (the caraways and common and corn parsleys); 14. Sison (stonewort); 15. Falcaria; 16. Sium (the water-parsnips); 17. Aegopodium (gout weed); 18. Pimpinella (the burnet saxifrages); 19. Conopodium (pig nut); 20. Myrrhis (sweet cicely); 21. Chaerophyllum (rough chervil); 22. Scandix (shepherd's needle); 23. Anthriscus (the beaked parsleys and garden chervil); 24. Seseli (mountain meadow saxifrage); 25. Foeniculum (fennel); 26. Crithmum (rock samphire); 27. Oenanthe (the water dropworts); 28. Aethusa (fool's parsley); 29. Siler; 30. Silaus (pepper saxifrage); 31. Meum (spignel); 32. Ligusticum (lovage); 33. Selinum (false milk parsley); 34. Angelica; 35. Archangelica; 36. Peucedanum (sulphur-wort, milk parsley, masterwort, and common parsnip); 37. Heracleum (cow parsnip); 38. Tordylium (hartwort); 39. Coriandrum (coriander); 40. Daucus (carrot); 41. Caucalis (the bur-parsleys and hedge parsleys).

35TH ORDER: ARALIACEAE—1 GENUS.

1. Hedera (common ivy).

PLANT FAMILIES

36TH ORDER: CORNACEAE—1 GENUS.

1. *Cornus* (cornel).

We now come to the second sub-class of the Dicotyledons—the Sympetalae, and in this the first series is the Epigynae, with seven orders.

37TH ORDER: CAPRIFOLIACEAE—5 GENERA.

1. *Adoxa* (moschatel); 2. *Sambucus* (elder); 3. *Viburnum* (guelder rose); 4. *Linnaea* (*Linnaea borealis*); 5. *Lonicera* (honeysuckle).

38TH ORDER: RUBIACEAE—4 GENERA.

1. *Rubia* (wild madder); 2. *Galium* (the bed-straws, crosswort, and goose grass); 3. *Asperula* (sweet woodruff and quinsywort); 4. *Sherardia* (field madder).

39TH ORDER: VALERIANEAE—3 GENERA.

1. *Valeriana* (the valerians); 2. *Centranthus* (spur-valerian); 3. *Valerianella* (the corn-salads).

40TH ORDER: DIPSACEAE—2 GENERA.

1. *Dipsacus* (the teasles); 2. *Scabiosa* (the devil's-bit, small, and field scabiouses).

41ST ORDER: COMPOSITAE—48 GENERA.

1. *Eupatorium* (hemp agrimony); 2. *Solidago* (golden-rod); 3. *Bellis* (common daisy); 4. *Aster* (sea-starwort and goldilocks); 5. *Erigeron* (the Canadian, blue, and Alpine fleabanes); 6. *Filago* (five of the cudweeds); 7. *Antennaria* (mountain everlasting); 8. *Anaphalis*; 9. *Gnaphalium* (five of the cud-weeds); 10. *Inula* (elecampane, ploughman's spikenard, and golden samphire); 11. *Pulicaria* (common and small fleabanes); 12. *Xanthium* (burweed); 13. *Bidens* (the bur marigolds); 14. *Galinsoga*; 15. *Achillea* (yarrow and sneezewort); 16. *Diotis* (cotton-weed); 17. *Anthemis* (the chamomiles); 18. *Chrysanthemum* (corn marigold, ox-eye daisy, and common feverfew); 19. *Matricaria* (the feverfews); 20. *Cotula*; 21. *Tanacetum* (tansy); 22. *Artemisia* (the wormwoods and mugwort); 23. *Tussilago* (colt's foot); 24. *Petasites* (butterbur and winter heliotrope); 25. *Doronicum* (leopard's-bane); 26. *Senecio* (the groundsels, fleaworts, and ragworts); 27. *Carlina* (carline thistle); 28. *Arctium* (the burdocks); 29. *Carduus* (slender-flowered, musk, and wellet thistles); 30. *Cnicus* (the plume thistles); 31. *Onopordon* (Scottish thistle); 32. *Mariana* (milk thistle); 33. *Saussurea*; 34. *Serratula* (saw-wort); 35. *Centaurea* (the knapweeds, cornflower, and star-thistles); 36. *Cichorium* (common succory or wild chicory); 37. *Arnoseris* (lamb's succory); 38. *Lapsana* (nipplewort); 39. *Picris* (picris and ox-tongue); 40. *Crepis* (the hawk's-beards); 41. *Hieracium* (the hawkweeds); 42. *Hypochaeris* (the cat's-ears); 43. *Leontodon* (the hawk-bits); 44. *Taraxacum* (dandelion); 45. *Lactuca* (the lettuces); 46. *Prenanthes*; 47. *Sonchus* (the sow-thistles); 48. *Tragopogon* (goat's-beard and salsify).

42ND ORDER: CAMPANULACEAE—6 GENERA.

1. *Lobelia*; 2. *Jasione* (sheep's-bit scabious); 3. *Wahlenbergia* (ivy-leaved bell-flower); 4. *Phyteuma* (round-headed and spiked rampions); 5. *Campanula* (clustered, nettle-leaved, giant, creeping, and spreading bell-flowers, harebell, and rampion); 6. *Specularia* (Venus' looking-glass).

43RD ORDER: VACCINIACEAE—2 GENERA.

1. *Vaccinium* (cowberry, bilberry, and bog whortleberry); 2. *Schollera* (cranberry).

The second series of the sub-class Sympetalae is the Hypogynae, and this contains the following 18 orders:

44TH ORDER: ERICACEAE—10 GENERA.

1. *Arbutus* (strawberry-tree); 2. *Arctostaphylos* (black and red bearberry); 3. *Andromeda*; 4. *Calluna* (heather); 5. *Erica* (the heaths); 6. *Loiseleuria* (trailing azalea); 7. *Bryanthus* (*menziesia*); 8. *Boretta* (*St. Dabeoc's* heath); 9. *Pyrola* (the winter-greens); 10. *Moneses* (single-flowered winter-green).

45TH ORDER: MONOTROPEAE—1 GENUS.

1. *Hypopitys* (pine bird's-nest).

46TH ORDER: PLUMBAGINEAE—2 GENERA.

1. *Statice* (the sea-lavenders); 2. *Armeria* (thrift or sea-pink).

47TH ORDER: PRIMULACEAE—9 GENERA.

1. *Hottonia* (water violet); 2. *Primula* (primrose, cowslip, oxslip); 3. *Cyclamen* (ivy-leaved sowbread); 4. *Lysimachia* (the loosestrifes, creeping-jenny, and yellow pimpernel); 5. *Trientalis* (winter-green chickweed); 6. *Glaux* (sea-milkwort); 7. *Anagallis* (scarlet, blue, and bog pimpernels); 8. *Centunculus* (chaffweed or bastard pimpernel); 9. *Samolus* (brookweed).

48TH ORDER: OLEACEAE—2 GENERA.

1. *Fraxinus* (ash); 2. *Ligustrum* (privet).

49TH ORDER: APOCYNACEAE—1 GENUS.

1. *Viñca* (the periwinkles).

50TH ORDER: GENTIANEAE—7 GENERA.

1. *Microcala* (least gentianella); 2. *Blackstonia* (yellow wort); 3. *Erythraea* (the centauries); 4. *Cicendia* (Guernsey gentianella); 5. *Gentiana* (the gentians); 6. *Menyanthes* (buck-bean); 7. *Limnanthemum* (water villarsia).

51ST ORDER: POLEMONIACEAE—1 GENUS

1. *Polemonium* (Jacob's ladder).

52ND ORDER: BORAGINEAE—11 GENERA.

1. *Cynoglossum* (the hound's-tongues); 2. *Asperugo* (madwort); 3. *Symphytum* (the comfrees); 4. *Borago* (borage); 5. *Anchusa* (the alkanets); 6. *Lycopsis* (small bugloss); 7. *Pulmonaria* (the lungworts); 8. *Pneumaria* (smooth gromwell); 9. *Myosotis* (the scorpion-grasses, mouse-ear, and the forget-me-nots); 10. *Lithospermum* (purple, common, and corn gromwell); 11. *Echium vulgare* (viper's bugloss).

53RD ORDER: CONVULVULACEAE—3 GENERA.

1. *Volulus* (great and sea bindweeds); 2. *Convolvulus* (field bindweed); 3. *Cuscuta* (the dodders).

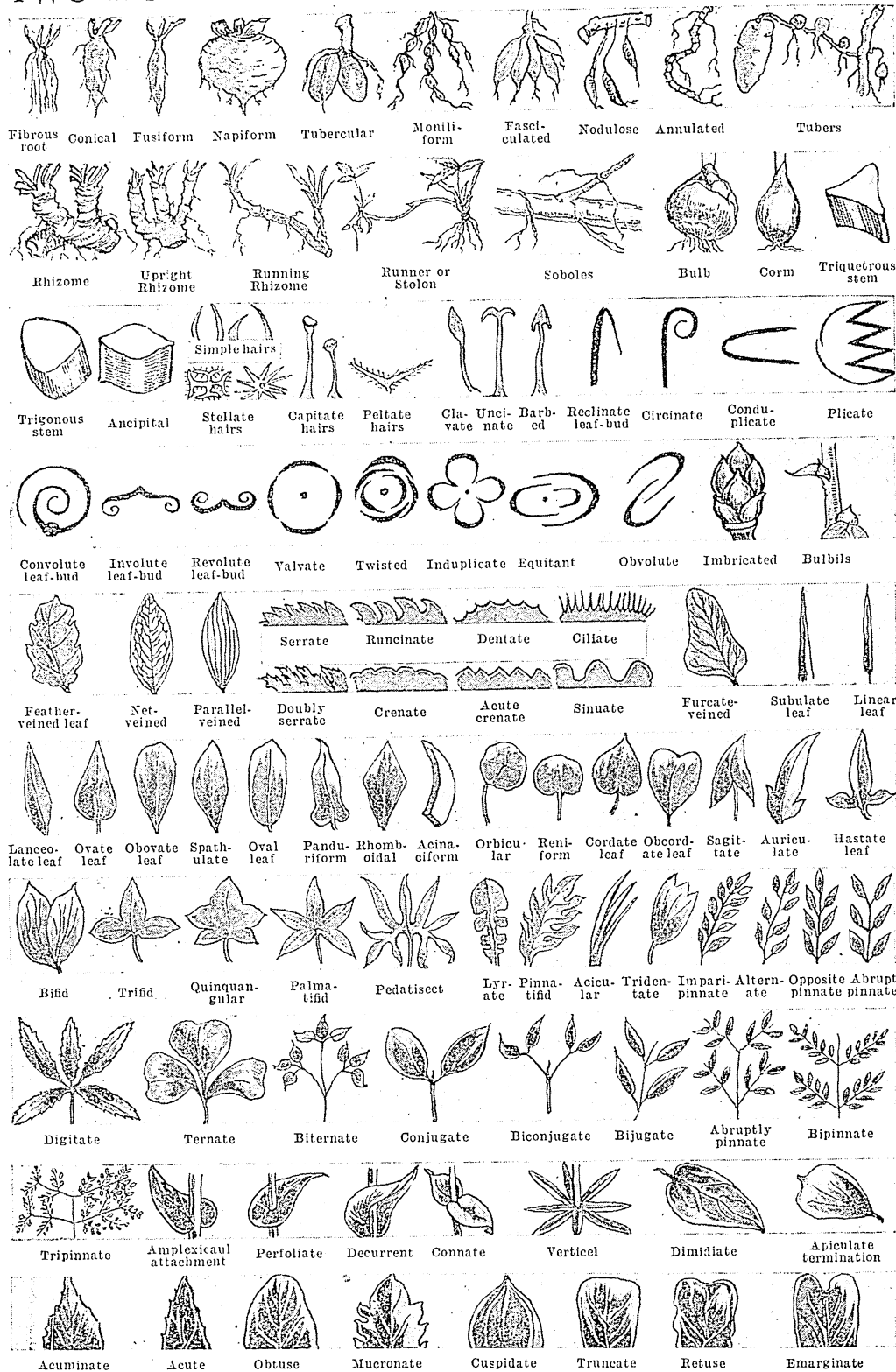
54TH ORDER: SOLANACEAE—5 GENERA.

1. *Solanum* (woody and black nightshades); 2. *Lycium*; 3. *Atropa* (deadly nightshade); 4. *Datura* (thorn apple); 5. *Hyoscyamus* (henbane).

55TH ORDER: SCROPHULARINEAE—14 GENERA.

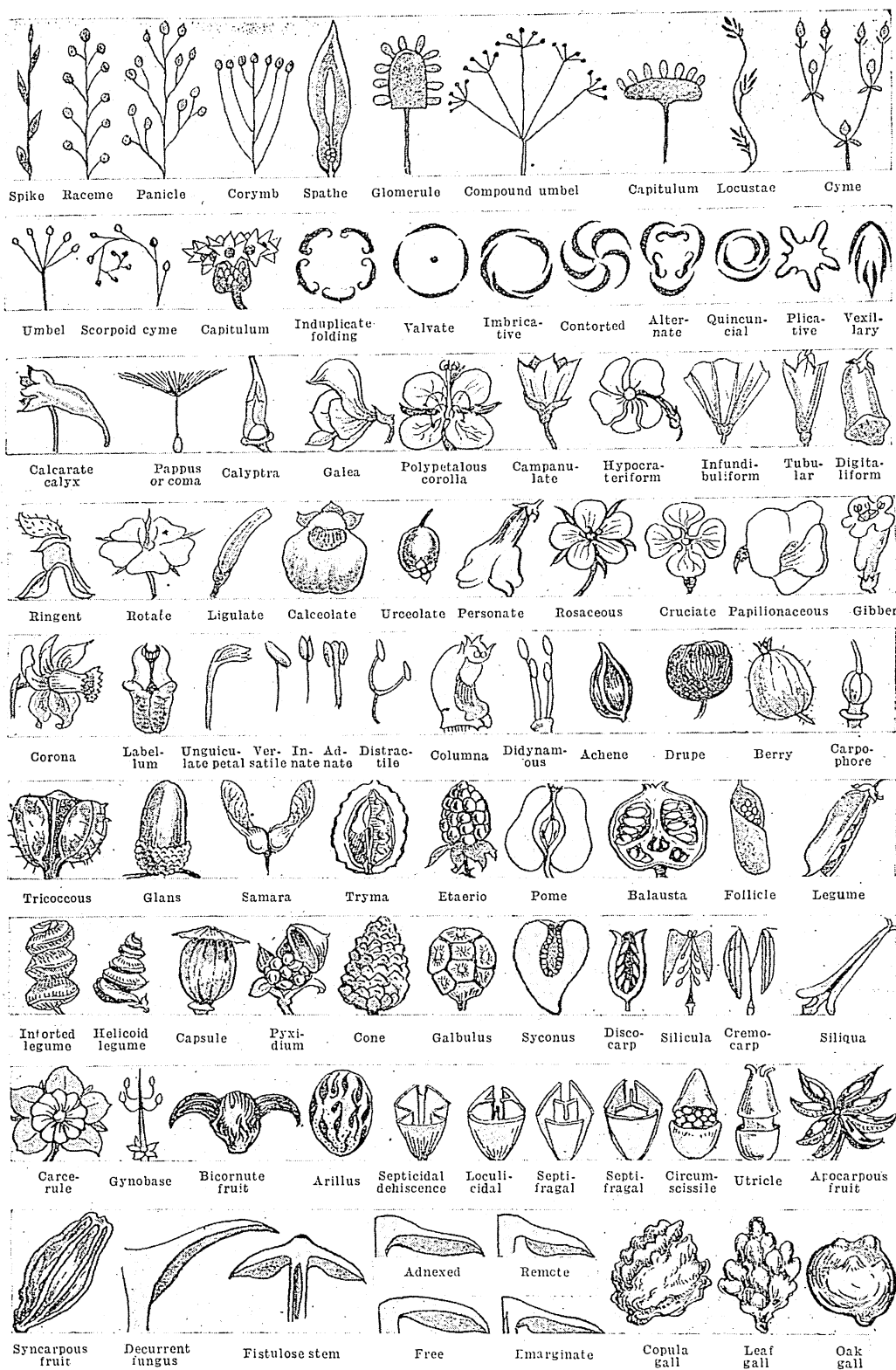
1. *Verbascum* (the mulleins); 2. *Linaria* (the toad-flaxes); 3. *Antirrhinum* (the snapdragons); 4. *Scrophularia* (the figworts); 5. *Mimulus* (monkey-flower); 6. *Limosella* (mudwort); 7. *Sibthorpia* (Cornish money-wort); 8. *Digitalis* (foxglove); 9. *Euphrasia* (eye-bright); 10. *Bartsia*; 11. *Pedicularis* (the red-rattles); 12. *Rhinanthus* (the yellow-rattles); 13. *Melampyrum* (the cow-wheats); 14. *Veronica* (the speedwells and brooklime).

TWO HUNDRED THINGS IN THE PLANT WORLD



ON THESE PAGES THE VARIOUS PARTS OF PLANTS AND THE FORMS THEY TAKE ARE SHOWN IN A

A PICTURE-DICTIONARY OF TERMS IN BOTANY



SERIES OF 200 PICTURES, AND THE TECHNICAL OR BOTANICAL NAME FOR EACH PART IS GIVEN

PLANT LIFE

56TH ORDER: OROBANCHACEAE—2 GENERA.

1. Orobancha (the various broom-rapes);
2. Lathraea (toothwort).

57TH ORDER: LENTIBULARIEAE—2 GENERA.

1. Utricularia (the bladderworts);
2. Pinguicula (the butterworts).

58TH ORDER: VERBENACEAE—1 GENUS.

1. Verbena

59TH ORDER: LABIATAE—19 GENERA.

1. Mentha (the mints, peppermint, and spearmint);
2. Lycopus (gipsywort);
3. Origanum (common marjoram);
4. Thymus (the thymes);
5. Calamintha (basil, basil thyme, and the calamints);
6. Melissa (balm);
7. Salvia (sage and clary);
8. Nepeta (catmint and ground ivy);
9. Scutellaria (the skull-caps);
10. Prunella (self-heal);
11. Melittis (bastard balm);
12. Marrubium (white horehound);
13. Stachys (wood betony and the woundworts);
14. Galeopsis (the hemp-nettles);
15. Leonurus (motherwort);
16. Lamium (the dead-nettles and henbit nettle);
17. Ballota (black horehound);
18. Teucrium (the germanders);
19. Ajuga (the bugles and ground pine).

60TH ORDER: PLANTAGINEAE—2 GENERA.

1. Plantago (the various plantains);
2. Littorella (shoreweed).

61ST ORDER: ILLECEBRACEAE—4 GENERA.

1. Illecebrum (knot-grass);
2. Herniaria (the rupture-worts);
3. Corrigiola (strapwort);
4. Scleranthus (the knawels).

Here we come to the third sub-class of the Dictyledons—the Incompletae, with flowers having a calyx or corolla, or neither, but never both. In this sub-class the first series is the Monochlamydeae, with nine orders.

62ND ORDER: AMARANTHACEAE—1 GENUS.

1. Amaranthus (amaranth).

63RD ORDER: CHENOPODIACEAE—6 GENERA.

1. Chenopodium (the goosefoots, and Good King Henry);
2. Beta (sea-beet);
3. Atriplex (the oraches, and sea purslanes);
4. Salicornia (the glassworts);
5. Suaeda (the sea-blites);
6. Salsola (the saltworts).

64TH ORDER: POLYGONACEAE—4 GENERA

1. Polygonum (black bindweed, copse buckwheat, the knot grasses, the persicarias, and the bistorts);
2. Fagopyrum (buckwheat);
3. Oxyria (mountain sorrel);
4. Rumex (the docks, monk's rhubarb, and the sorrels).

65TH ORDER: THYMELAEACEAE—1 GENUS.

1. Daphne (mezereon and spurge laurel).

66TH ORDER: ELAEAGNACEAE—1 GENUS.

1. Hippophae (sea buckthorn).

67TH ORDER: URTICACEAE—4 GENERA.

1. Ulmus (wych and common elms);
2. Humulus (hop);
3. Urtica (stinging, Roman, and small nettles);
4. Parietaria (pellitory).

68TH ORDER: ARISTOLOCHIACEAE—2 GENERA.

1. Asarum (asarabacca);
2. Aristolochia (common birthwort).

69TH ORDER: LORANTHACEAE—1 GENUS.

1. Viscum (mistletoe).

70TH ORDER: SANTALACEAE—1 GENUS.

- *1. Thesium (bastard toad-flax).

The second series of the sub-class Incompletae is the Achlamydeae, and this contains the following six orders.

71ST ORDER: EMPETRACEAE—1 GENUS.

1. Empetrum (crowberry).

72ND ORDER: EUPHORBACEAE—3 GENERA

1. Euphorbia (the spurges);
2. Buxus (box-tree);
3. Mercurialis (dog's and annual mercury).

73RD ORDER: CERATOPHYLLAE—1 GENUS.

1. Ceratophyllum (hornwort).

74TH ORDER: MYRICACEAE—1 GENUS.

1. Myrica (bog myrtle).

75TH ORDER: CUPULIFERAE—7 GENERA.

1. Betula (the birches);
2. Alnus (alder);
3. Carpinus (hornbeam);
4. Corylus (hazel);
5. Quercus (the oaks);
6. Castanea (sweet chestnut);
7. Fagus (beech).

76TH ORDER: SALICINEAE—2 GENERA.

1. Salix (the willows, osiers, and sallows);
2. Populus (the poplars and aspen).

We now come to the second class of flowering plants, the Monocotyledons, and begin with the sub-class of Petaloideae. In this the first series is the Epigynae, which contains the following five orders:

77TH ORDER: HYDROCHARIDEAE—3 GENERA.

1. Elodea (American waterweed);
2. Hydrocharis (frogbit);
3. Stratiotes (water soldier).

78TH ORDER: ORCHIDEAE—16 GENERA.

1. Malaxis (bog orchis);
2. Liparis (fen orchis);
3. Corallorhiza (coral root);
4. Neottia (bird's nest orchis);
5. Listera (the twayblades);
6. Spiranthes (lady's tresses);
7. Goodyera;
8. Epipogon;
9. Cephalanthera (red, narrow-leaved, and white helleborines);
10. Epipactis (broad-leaved, dark-flowered, and marsh helleborines);
11. Orchis (lizard, pyramidal, dwarf, great brown-winged, military, monkey, green-winged meadow, early purple, lax-flowered, crimson marsh, and spotted orchids);
12. Aceras (man orchid);
13. Ophrys (bee, spider, and fly orchids);
14. Herminium (musk orchid);
15. Habenaria (sweet-scented, frog, lesser and greater butterfly orchids);
16. Cypripedium (lady's slipper).

79TH ORDER: IRIDEAE—5 GENERA.

1. Iris (stinking and yellow irises);
2. Crocus;
3. Romulea;
4. Sisyrinchium (narrow-leaved blue-eyed grass);
5. Gladiolus.

80TH ORDER: AMARYLLIDEAE—3 GENERA

1. Narcissus (daffodil);
2. Galanthus (snowdrop);
3. Leucojum (snowflake).

81ST ORDER: DIOSCOREAE—1 GENUS.

1. Tamus (black bryony).

The second series of the sub-class Petaloideae among the Monocotyledons is the Hypogynae, with these eight orders:

PLANT FAMILIES

82ND ORDER: LILIACEAE—19 GENERA.

1. *Ruscus* (butcher's broom); 2. *Asparagus*; 3. *Polygonatum* (Solomon's seal); 4. *Maianthemum* (May lily); 5. *Convallaria* (lily-of-the-valley); 6. *Simethis*; 7. *Allium* (the leeks, garlics, chives, and ramsons); 8. *Muscari* (grape hyacinth); 9. *Scilla* (autumnal and vernal squills and wild hyacinth); 10. *Ornithogalum* (common, drooping, and spiked star of Bethlehem); 11. *Lilium* (Pyrenean and Turk's cap lilies); 12. *Fritillaria* (fritillary); 13. *Tulipa* (tulip); 14. *Gagea* yellow star of Bethlehem); 15. *Lloydia* (spiderwort); 16. *Colchicum* (meadow saffron); 17. *Nartheceum* (bog asphodel); 18. *Tofieldia* (Scottish asphodel); 19. *Paris* (herb Paris).

83RD ORDER: JUNCACEAE—2 GENERA.

1. *Juncus*; 2. *Juncoides*. These include all the species of rushes.

84TH ORDER: TYPHACEAE—2 GENERA.

1. *Typha* (great and lesser reed-maces); 2. *Sparganium* (the bur-reeds).

85TH ORDER: AROIDEAE—2 GENERA.

1. *Arum* (cuckoo-pint); 2. *Acorus* (sweet sedge).

86TH ORDER: LEMNACEAE—2 GENERA.

1. *Lemna* (the duckweeds); 2. *Wolffia*.

87TH ORDER: ALISMACEAE—5 GENERA.

1. *Alisma* (great and lesser water plantains); 2. *Elisma* (floating water plantain); 3. *Sagittaria* (arrowhead); 4. *Damasonium* (star fruit); 5. *Butomus* (flowering rush).

88TH ORDER: NAIADACEAE—7 GENERA.

1. *Triglochin* (the arrow grasses); 2. *Scheuchzeria*; 3. *Potamogeton*; 4. *Ruppia*; 5. *Zannichellia* (these last three genera include the pond-weeds); 6. *Zostera* (the grass wracks); 7. *Najas*.

89TH ORDER: ERIOCAULEAE—1 GENUS.

1. *Eriocaulon* (pipe wort).

The second sub-class of the Monocotyledons is the Glumiferae, which includes two orders, the genera of which cannot be named here owing to lack of space. They are:

90TH ORDER: CYPERACEAE, THE SEDGE FAMILY, with nine genera, including the spike rushes, club rushes, mud rushes, bulrushes, cotton grasses, bog rushes, carnation grass, and all the sedges.

91ST ORDER: GRAMINEAE, THE GRASS FAMILY, with 48 genera, including all the grasses.

In the second division of flowering plants the Gymnosperms, one class only, that of the Coniferae, is represented in Britain, and this includes two orders.

92ND ORDER: ARAUCARIACEAE—2 GENERA.

1. *Finus* (Scots fir and cluster pine); 2. *Juniperus* (the junipers).

93RD ORDER: TAXACEAE—1 GENUS.

1. *Taxus* (the common yew).

There are, of course, many other orders and genera of plants, but these are not

represented among the native plants of Britain that grow wild.

A word should perhaps be said about the names used for the various orders, genera, and species of plants, and the scientific terms for describing leaves, flowers, stems, and so on. These look very forbidding, but it is necessary that scientists should use terms which can be recognised and understood by the scientists of all nations, and Latin is the only suitable language.

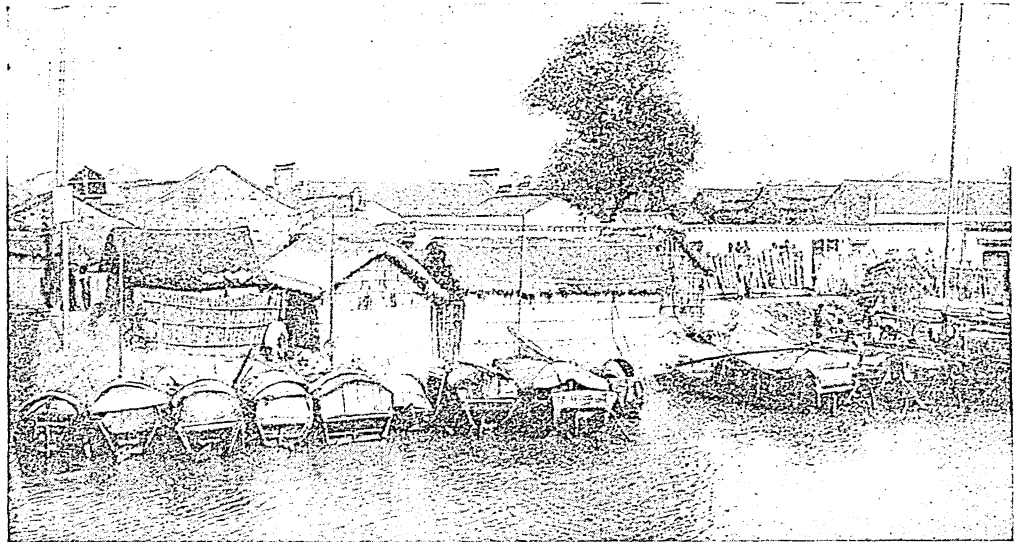
When a new plant is discovered, therefore, it is given a Latin name. These names are not generally the Latin that was used by the ancient Romans; they are mostly new words, descriptive of the plants, made up from the roots of various old Latin words. In some cases they are Greek words turned into the Latin form. Thus, *chrysanthemum* is made up from two Greek words meaning gold and a flower, which have been turned into a Latin word. In some cases the plant is named after a famous botanist, like the *linnaea*, named in honour of Linnaeus.

The same plan is followed in inventing botanical terms to describe the parts of plants. Thus, a compound leaf with four pairs of leaflets is called *quadri-jugate*, which is made up from the two Latin words *quadrans* (fourth) and *jugum* (a yoke), each pair of leaves looking something like a yoke.

There is, therefore, a method in the apparent madness of these difficult-looking names in botany, for, while an English name like bluebell may be given to several plants, when we have the Latin name also we know at once, without possibility of error, exactly what plant is meant.

The English names of plants are too often based on appearances instead of on scientific structure, and, as we know, appearances are deceitful. The yellow loosestrife, for instance, is not a loosestrife at all, but a primrose; the flowering rush is not a rush but a water plantain; the water violet is not a violet, but a primrose. There are two plants called the bluebell, one being the harebell, a member of the bell-flower family, and the other the wild hyacinth, a member of the lily family. The white bryony and black bryony are not connected in any way, white bryony being a member of the gourd family and black bryony a member of the yam family. When, therefore, we come to study plants scientifically, we must know their scientific or Latin names.

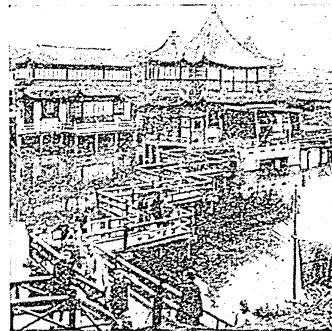
LIFE IN THE FAR EAST



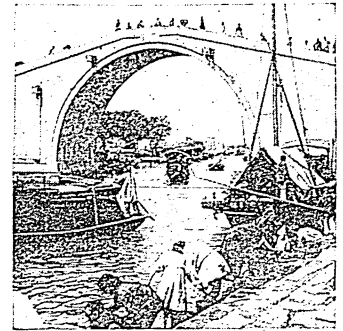
A BOAT QUAY IN THE NATIVE QUARTER OF NANKING, ON THE YANGTSE-KIANG RIVER



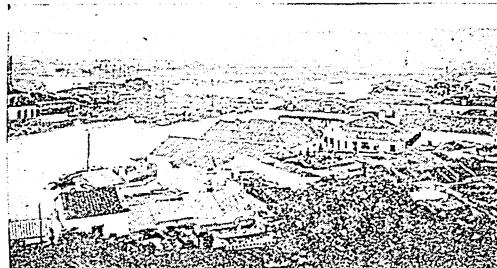
A DECORATIVE ARCH IN A STREET IN TIENTSIN



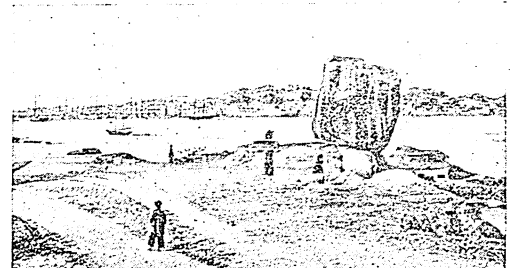
A QUAIN BRIDGE IN OLD SHANGHAI



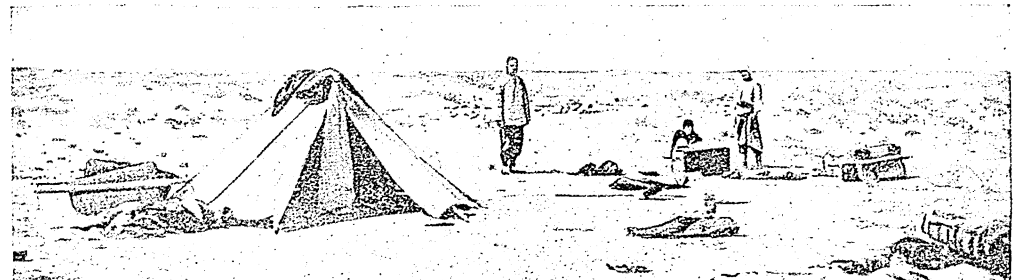
A BRIDGE ON THE IMPERIAL CANAL AT SOOCHOW



THE CITY OF FOOCOW ON THE MIN RIVER



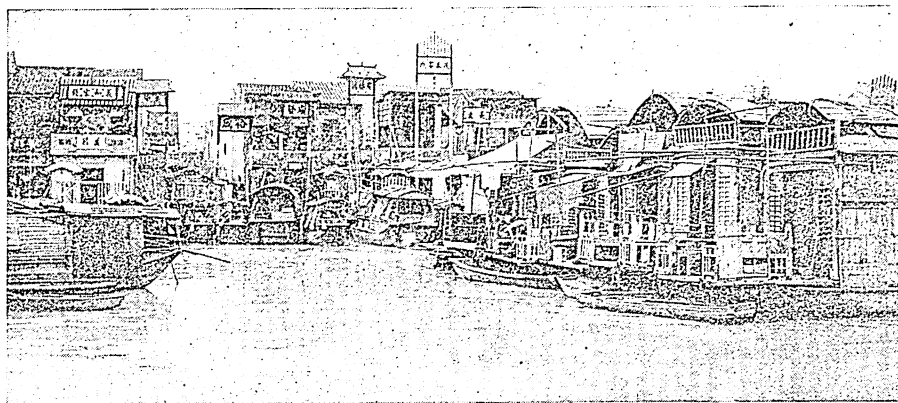
THE SEAPORT OF AMOY



A TYPICAL CAMP IN A DESERT REGION OF MONGOLIA

The pictures on these pages are by Messrs. Ewing Galloway, Underwood, the E.N.A., and others

The Story of the Peoples of All Nations and Their Homelands



Flower boats at Canton

CHINA AND HER NEIGHBOURS

CHINESE territory covers one quarter of Asia. The mother country alone, China proper, is nearly thirty times larger than England. The Empire is by far the oldest in the world. Next to the British Empire it is the most populous empire that has ever existed. Over 420,000,000 people live in its great cities, on its fertile plains, along its crowded waterways, and in the mountainous spaces that connect it with Siberia, Turkestan, and India.

Though China is so vast, old, and populous, no inhabited part of the Earth is so little known. We know something of its products—its silks, its porcelain, its ivory carvings; we drink its tea; we see something of its yellow, slant-eyed people, for, by pressure of numbers, they spread thinly over nearly the whole world; but we have only a general knowledge of the country itself. Few Europeans have moved freely about it, traced its rivers, mapped its mountains, crossed its deserts, or studied closely the outlying regions whence, in the past, successive waves of invading races have rolled over the West.

China has been partly shut in by Nature. On her seaward side is the vast Pacific Ocean, not readily crossed by the small seacraft of long ago. On the landward sides she is surrounded by great forests, lofty mountains, and deserts strewn with

the ruins of mountains that have crumbled and been scattered by the winds. In the past it was no easy task to reach her, or for her to reach the outer world. So long did she live in isolation, self-contained and satisfied, that she ceased to wish to know the world. As far as she could she barred it out. She had her own idea of what life should be, her own history, learning, religion, and civilisation. The rest of the world only heard of her through distant echoes. She was a land remote and mysterious to Jew, Greek, and Roman, and she has been little else to the more modern world until quite recent times. Yet she is inhabited by the largest mass of similar people on the Earth, a race profoundly patient and industrious. What they will become in the future is perhaps the world's greatest problem.

To see the Chinese Empire aright we must begin our survey far inland, in the very centre of Asia; for there two of the great rivers rise which fertilise eastern China, and enable her teeming millions to sustain themselves. Also from these outlying lands have come races, less numerous than the Chinese, who have governed her for centuries, though they govern her no longer. The great problem of China has been the protection of her vast population in the plains against the smaller

THE FIVE CONTINENTS & 100 NATIONS & RACES THAT INHABIT THEM

numbers of vigorous people living in the less fertile mountainous lands around her. At one time she tried to shield herself behind great walls, but the plan failed.

Later she extended her rule over these thinly populated mountain lands, so that Tibet, Chinese Turkestan, Mongolia, and Manchuria were all ruled by China, and her Empire was about seventy-five times as large as England and Wales. But within quite recent times China has lost her hold of more than half of these mountain lands, and, though she claims to be suzerain, she has no real power, and does not govern them. This is so in Tibet and Mongolia, and to a less extent Chinese Turkestan and Manchuria have slackened the bonds that united them with China, and are semi-independent.

If we could take our stand at the extreme western point of the Chinese Empire we should find, where Russian Turkestan, Afghanistan, India, and China meet, a lofty, bare plateau, covering hundreds of square miles, surrounded by still loftier mountains, which branch off in all directions, and bear on their deeply-seamed shoulders enormous glaciers—by far the largest in the world. This plateau, known as The Pamirs, has been called The Roof of the World. Its general height is greater than the summit of Mont Blanc, and the peaks in the ranges which branch off from it reach 10,000 feet higher.

The mountains skirting the Pamirs on the western side look over the steppes of Russian Turkestan and the course of the River Oxus towards the Aral and Caspian Seas. South-westward the Hindu Kush Range passes into Afghanistan, and southward the Suleiman Range makes a frontier barrier between Afghanistan and India. South-eastward the Karakoram Range makes a barrier between Tibet and Kashmir; and more to the south and east the enormous Himalayan Range is the southern boundary of Tibet. Eastward the great Kwen-lun Range, 20,000 feet in height,

starting from the Pamir plateau, forms a northern boundary for the great tableland of Tibet, and a southern boundary for Chinese Turkestan or Sinkiang; and to the north-east the Tien-shan Mountains, and other ranges separate Chinese Turkestan and Mongolia from Siberia. These mountains, branching off from the lofty Pamir plateau, separate countries and territories all round, screening different races and tribes from each other, preserving old traditions, and a love of liberty in each part, and rearing, in the midst of dangers, men who are hardy and brave, but who may become a threat to the peaceful people of adjacent low-lying, populous and fertile lands. That is why China finds it advisable to conquer all the land between these diverging mountain ranges right up to the Pamirs. And the spirit of the people has been such that as soon as China lost her power they sought to free themselves from the remnants of her rule.

Before we cross from the Pamir plateau through the outlying parts of the Chinese Empire to China proper, we must glance round from the Roof of the World, rising from the very centre of Asia, at the people who live in the mountains which diverge from this central upland as spokes from the hub of a wheel, though not at regular distances. In the valleys of these great mountains are a number of small States, peopled by men of different races speaking a variety of languages, and though they are roughly associated with some larger country, such as British India, or the Protected State of Kashmir, or China, or Afghanistan, they have but little constant intercourse with the country which includes them in its "sphere of influence."

Instances of this are seen in the warlike tribes which live in the mountains that separate India from Afghanistan. This is a kind of no-man's-land, where Pathan tribes, such as the Waziris and the Afridis, are constantly in a state of unrest.

AFGHANISTAN AND ITS STORY

Though Afghanistan is now an entirely independent country, it is to a large extent inhabited by tribes not unlike those which find a precarious living in the mountains adjoining the North-West Frontier of India. Though Afghanistan has no connection with China, the chief subject of this article, except that their frontiers touch on the Pamir plateau, it

may be convenient here to glance at the Afghan State.

Northern Afghanistan is filled with the widely branching ranges of the Hindu Kush, which cross with diminishing height to the borders of Persia, and give rise to rivers, such as the Helmund and the Hari-rud, which pass into Persia only to be lost in its sandy and salt wastes. South

SCENES IN THE HEART OF ASIA



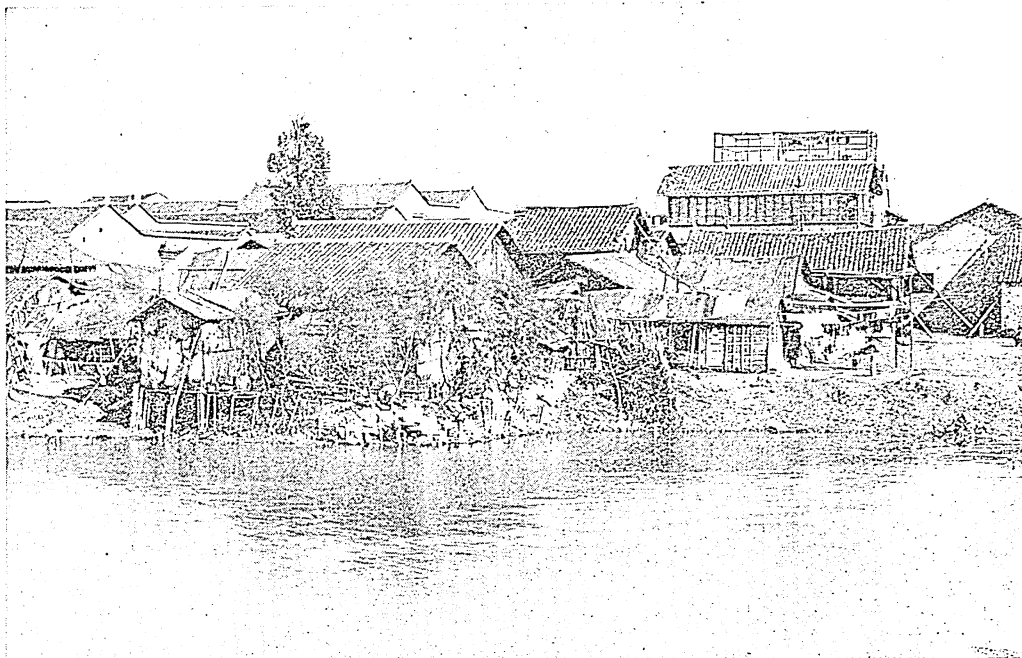
AN OLD MAN OF
MONGOLIA



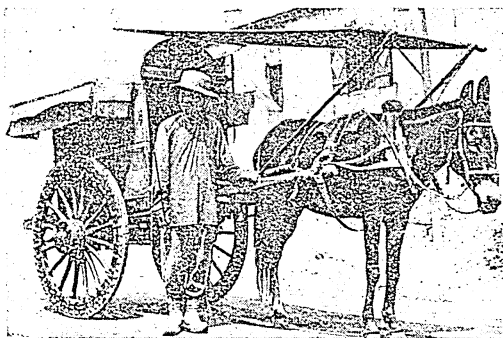
TWO BOYS OF
MONGOLIA



A DESCENDANT OF JENGHIZ
KHAN, THE MONGOL LEADER



HOUSES BY THE RIVER AT YARKAND, A CITY OF CHINESE TURKESTAN



A MANCHURIAN CABBY



THE ANCIENT LAMA TOWER AT MUKDEN

COUNTRIES

of the Helmund and merging into the British Protectorate of Baluchistan is the extensive desert of Registan. Though Afghanistan is mountainous in the north and desert in the south, it has fertile tracts, due often to careful irrigation. Where there is plentiful water, the summer heat allows two crops to be grown each year. Wheat is the chief cereal grown, but barley, lentils, millet, maize, and rice are cultivated. The special product is an abundance of fruits of all kinds that leaves a large surplus over for export. The animal most generally reared is the sheep, a kind peculiar to the country, with a tail of great size and fatness. Camels and horses are bred in large numbers, as is essential in a country where all transit of goods is by caravan, chiefly over mountain or desert tracks.

Afghanistan is divided into four provinces—Kabul around the capital, a city with about 100,000 inhabitants, with the beginnings of modern manufactures; Kandahar, with 60,000 people, the southern trade centre; Herat, with a population of 20,000, on the Hari-rud, the town that links Afghanistan with Persia; and Afghan Turkestan on the northern slopes of the mountains, with Nazar-i-Sherif as its capital. These four provinces represent varied interests of the Afghan people. The tribes centring on Kabul and Kandahar regard themselves as the only true Afghans, descendants of the lost tribes of Israel—and indeed the Israelitish cast of features is very common among them. In the west is an approximation to the Persian type, and Persian is the language generally spoken in place of the Afghan Pushtu. In the northern mountains, especially on their western side, is a Tartar

population akin to that of Russian Turkestan. The religion is almost exclusively Mohammedan, and in some districts, especially in the south, is fanatically held, to the danger of anyone holding any other faith.

As a warlike race holding a central position in mountain fastnesses between an aggressively expanding nation like Imperial Russia, and a populous country like India, with great variety of race, Afghanistan has played a conspicuous part in Eastern politics during the last century. Great Britain long regarded her as a buffer against Russian ambition, and her rulers have from time to time been subsidised by this country. It has never, however, been an easy matter to deal with a people who fiercely resented the appearance in their midst of foreigners, even on a friendly mission, and whose mountain warfare included a training in treachery. Again and again war was forced on British India, seldom with satisfactory results, for Afghanistan could not be held even if temporarily subdued. In 1842 a British-Indian army, withdrawing by arrangement, was ambushed and destroyed, only one Englishman escaping; and in 1879 the British envoy in Kabul and his staff were massacred. It was in the invasions of Afghanistan that were associated with this last act of treachery that Sir Frederick Roberts, afterwards Field-Marshal Earl Roberts, gained his fame as a general, and became the idol of the British army.

Now the only problem arising between Afghanistan and British India is the recurring difficulty of curbing the predatory and murderous habits of the tribes that make war their sport on the hills between the two countries.

MONGOLIA AND CHINESE TURKESTAN

Returning to our survey from the side of the Pamirs opposite to Afghanistan, we note that those lofty tablelands sink steeply down on their eastern side into the great hollow of Chinese Turkestan, a hollow so deep in the midst of its surrounding mountains that there is no exit from the depression for the rivers formed by the melting of the snows and by the seasonal rains. Indeed, this part of the Chinese Empire, and its continuation eastward into Mongolia, were formerly themselves a great inland sea, like the Mediterranean, but surrounded by mountains much higher than the present

Tien-shan to the north, and the Kwen-lun to the south. This sea has long ago dried up, and the mountains to the north have crumbled into gravel, sand, and mud, so that the greater part of Chinese Turkestan is now a dun-coloured desert with shifting sandhills that have drifted over a country once fertile and probably thickly populated. And farther to the east, in Mongolia, the trackless desert is covered with stones and gravel. The wind-borne remains of crumbled mountains cover the bed of an evaporated sea.

In the western part of this region, from the lofty mountains that skirt the Pamirs,

one river descends eastward into the plain, and continues its course for a thousand miles before it is lost in the desert sands. The name of it is the Tarim. Near to the mountains its snow-fed waters fertilise the land, and on its banks are the ancient towns of Yarkand and Kashgar, but the farther it goes the lesser becomes its volume of water, and finally it disappears.

The only considerable towns in this desolate and ruined country besides Yarkand and Kashgar are Khotan in the south and Urumchi and Ili to the north of the Tien-shan mountains, on the watershed that descends towards Siberia.

There are strong reasons for supposing that the Aryan race, from whom all the principal races of Europe are said to be descended, had their original home in this inhospitable region, but moved westward as the country lost its fertility. Here, too, was the home and starting point of the Turks before they migrated to Asia Minor and accepted the Mohammedan religion by the way. From this country and from the grazing grounds around the Desert of Gobi, in Mongolia, came the hordes of Mongolian horsemen who, under

Jenghiz Khan, swept over Western Europe, carrying terror in their train, and also conquered China itself.

But the Mongols, after leaving their country as conquerors, whether they travelled westward to Europe or south-eastward to China, returned to their home in the depression among the mountains of Central Asia, and there they have decayed with the decay of their land under Nature's attacks. Only about 2,000,000 of them are now to be found either in Chinese Turkestan or Mongolia, chiefly as a pastoral people. The present inhabitants of Chinese Turkestan are to a large extent of Kirghiz race, and have crossed the mountains from the Russian Steppes. It is the early peoples of Central Asia, escaping from the slow ruin of their land by wind and weather, who have developed into the Nordic, Slav, and Mediterranean races.

Mongolia is almost as thinly peopled as Chinese Turkestan, even in the parts outside its great desert, second only in size to the Sahara. After the Great War Mongolia came under the influence of Bolshevik Russia, with whom it is allied as a Republic, having Urga as its capital.

TIBET AT THE TOP OF THE WORLD

Tibet, the great southern tableland, with an area fifteen times the size of England, and a population of about 2,000,000, was long kept, under Chinese influence, in more than Chinese seclusion from the rest of the world; but it has now withdrawn itself entirely from its political association with China, and has a friendly understanding with British India. In the summer months there is a fairly constant transit of goods between the Tibetan capital, Lhasa, and India, through Sikkim, by the great Himalayan passes, and also with Leh in Kashmir from western Tibet, and with Chinese Turkestan through the Karakoram pass.

The peculiar feature of Tibet is its religion, Lamaism, a corrupt form of Buddhism. The chief dignitary of the faith is the Grand or Dalai Lama, who lives in a palace near Lhasa, and shares authority, especially in spiritual matters, with the abbot or Tashi Lama of the monastery of Tashi Lunpo. The lamas live a monastic life, and form a priestly class far in excess, proportionately, of the number who devote themselves to a religious life in any other country. Every Tibetan family regards

it as a point of honour to have at least one of its sons a lama.

The Lamaist section of the Buddhist faith seems to us very mechanical, with its strange ceremonies, and its prayer-wheels turned not only by hand but also by wind and water. Its chief, however, the Dalai Lama, is held in reverence by Buddhists in other lands, such as China and Burma, and it has a very ancient sacred literature.

The people of Tibet are of Mongol origin. Their language is closely akin to Burmese. In stature the race runs small, but it has great physical endurance. The chief occupations are rearing of sheep, yaks, horned cattle, and horses, and the work of transit, carrying goods across their mountain-fenced central country.

In the early part of this century the trading relations of the Himalayan frontier States, Nepal, Sikkim and Bhutan, with Tibet were very strained, and finally, in 1904, a British army entered Lhasa to compel the Tibetans to fulfil their treaty obligations. Later, the Chinese began to reassert their suzerainty over Tibet more actively, but the Tibetans expelled their

officials and forces from the country; and Great Britain acknowledged the right of Tibet to self-government. Since that time the Tibetan authorities gave hearty assistance to the several heroic expeditions which attempted the conquest of Mount Everest, the highest mountain of their country, and also of the world.

In theory the government of Tibet is under the Dalai Lama, but actually it is carried on by a Regent and five ministers, with local commissioners scattered throughout the country at the principal monasteries, for Tibet is ruled through its religion. Lhasa, the capital, has a popula-

tion of between twenty and twenty-five thousand people. Important places on the trading routes are—Yatung, Gyantse, and Gartok in a gold-bearing district of the west.

From its central lofty position Tibet contributes helpfully to the surrounding countries by providing them with a generous water supply. To India she sends down the Brahmaputra round the eastern flank of the Himalayas, and from an adjacent source the Indus round the western flank of that stupendous range. Through the mountains that fall from the plateau eastward towards the plains of China proper she pours two great rivers.

MANCHURIA AND ITS PEOPLE

Eastward, beyond the deep depressions of Chinese Turkestan and Mongolia, a range of mountains, the Khingan, running from north to south, separates Mongolia from Manchuria. This populous province extends from the eastern end of the Great Wall of China northward to the Amur, the Siberian boundary river.

It has been the uncomfortable fate of China, during the last quarter of a century, not to know whether she has been the real mistress of this region. In 1894 Japan went to war with China, and occupied the southern part of Manchuria, while compelling China to relinquish whatever rights she had in the peninsula of Korea. Some leading European Powers, seeing the weakness of China, and the growing strength of Japan, made it their business to offer China protection. France, as China's friend, became possessed of considerable advantages in Further India (Cambodia); Germany became possessed of Kiao Chow, on the peninsula of Shantung, and built a fortress there; Russia acquired the right to build a fortress on the southern tip of Manchuria, the peninsula of Liao-tung; and Great Britain, as a precaution, leased Wei-hai-wei, for a naval station at the eastern end of Shantung. So all the Great Powers were more or less on the spot, professing to protect China, but really keeping watch on each other.

The Power that meant business on her own account was Russia. She gained railway rights through Manchuria, eastward to Vladivostock, and southward to Port Arthur, where she built a land and sea fortress of enormous strength which was commonly, though wrongly, supposed to be impregnable, and then completely dominated the whole province.

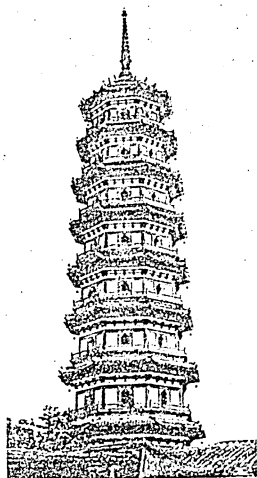
This was an over-riding of China, and a direct challenge to Japan. Japan accepted the challenge, and late in 1903 war with Russia began. It was fought out in Manchuria, and ended in a defeat which shook the foundations of the Russian Empire. Japan captured and retained Port Arthur, and succeeded the Russians in holding a position of influence throughout Manchuria. The Government, however, is Chinese, the country ranking as a dependency divided into three provinces, whose governors are nominated by the central Government of China proper.

The capitals of the three provinces are Mukden, which has about 200,000 people; Kirin, which has half as many; and Tsitsikhar. All have good railway communications. The ports are Newchwang and Dairen.

Manchuria is one of the most prosperous territories of China, and its population is constantly increasing through immigration from China proper. Now it probably numbers 20,000,000. This progress is due to the stimulating effects of railways, to an infusion of progressive energy from without, partly Japanese and partly European, and to the fertility and resources of the country. The old race, the Manchus, who became the ruling clique in China for nearly 300 years, are now a small minority in the land named from them. The Chinese have found that Manchuria has a soil and climate that will reward industry.

The whole territory is about seven times the size of England. Its chief crops are beans, wheat, millet and rice. It has much forest land, and its mineral riches include coal, iron, gold, silver, and lead. At present it is the best outlet for China's congested areas.

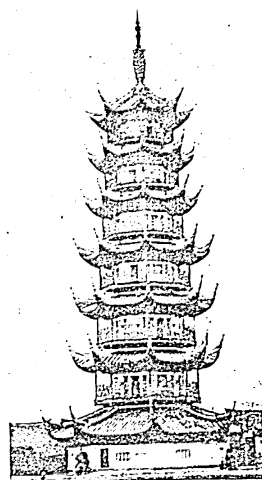
PICTURES OF CHINA



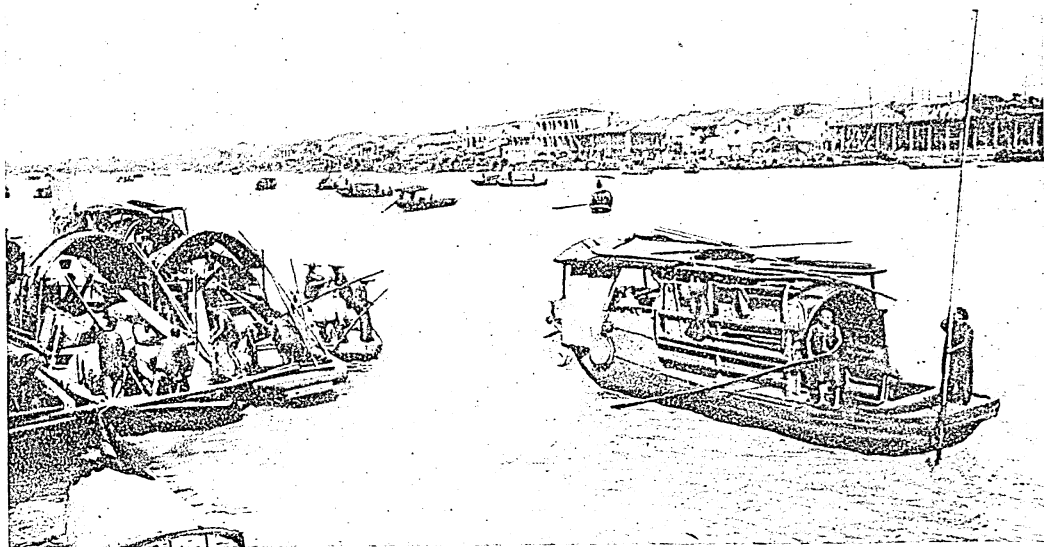
THE GREAT PAGODA
AT CANTON



A TYPICAL OLD
PEASANT



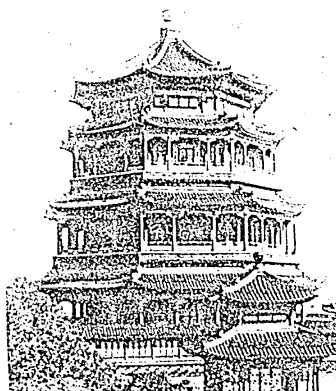
THE LUNG HUA PAGODA
AT SHANGHAI



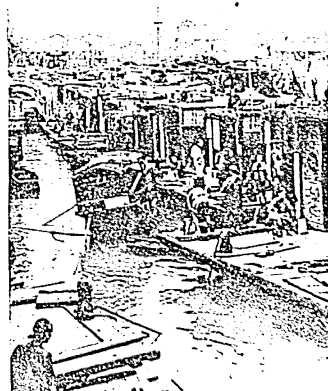
A SCENE ON THE GREAT PEARL RIVER AT CANTON



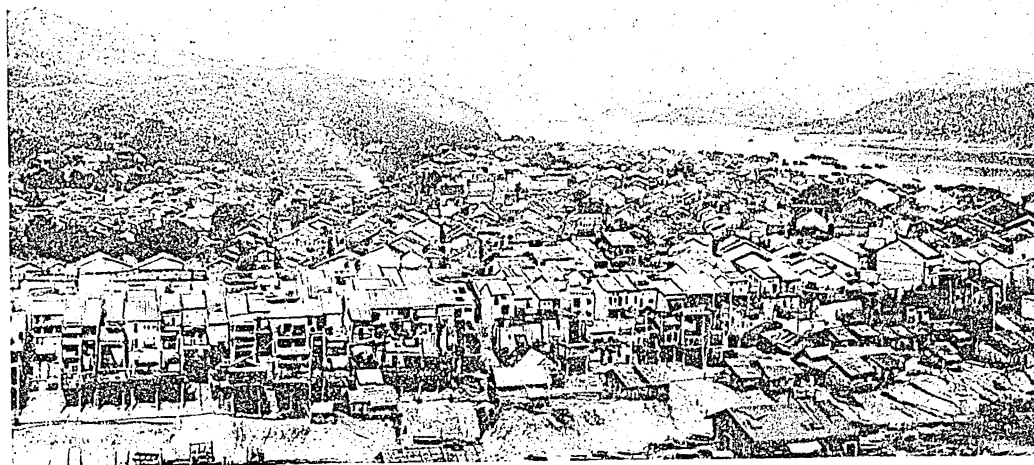
A STREET MARKET
IN PEKING



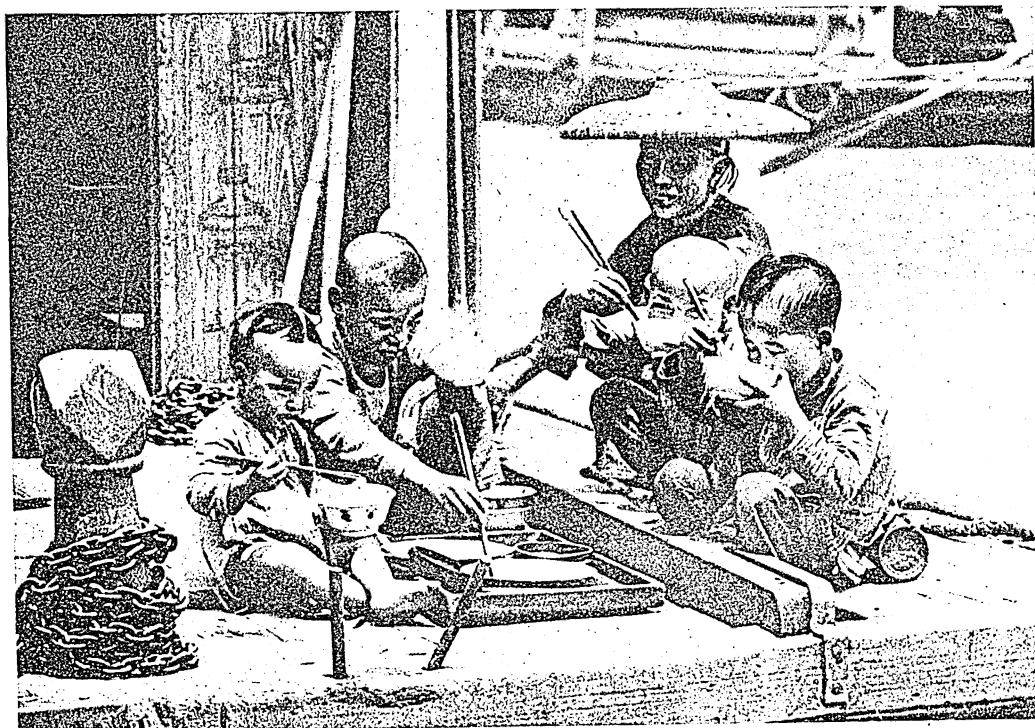
PORCELAIN TOWER AT THE OLD
SUMMER PALACE, PEKING



A STREET OF BOATS
IN CANTON



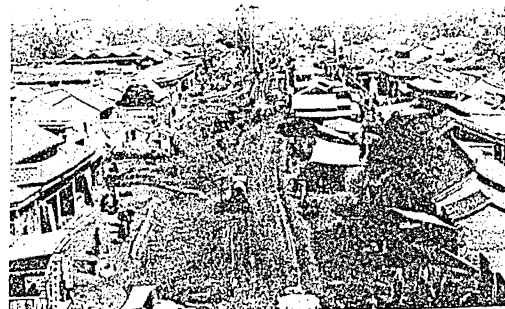
THE DENSE MASS OF HOUSES IN THE CITY OF CANTON



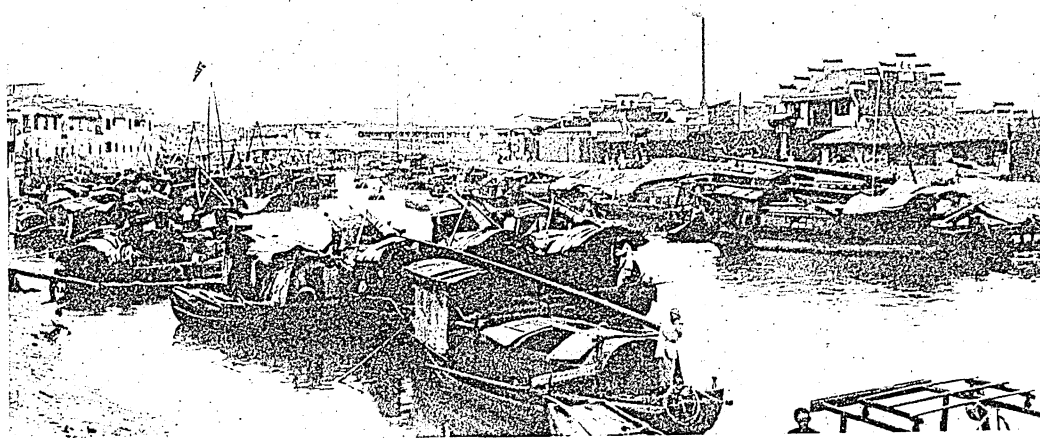
A HAPPY FAMILY ON A HOUSEBOAT AT CANTON



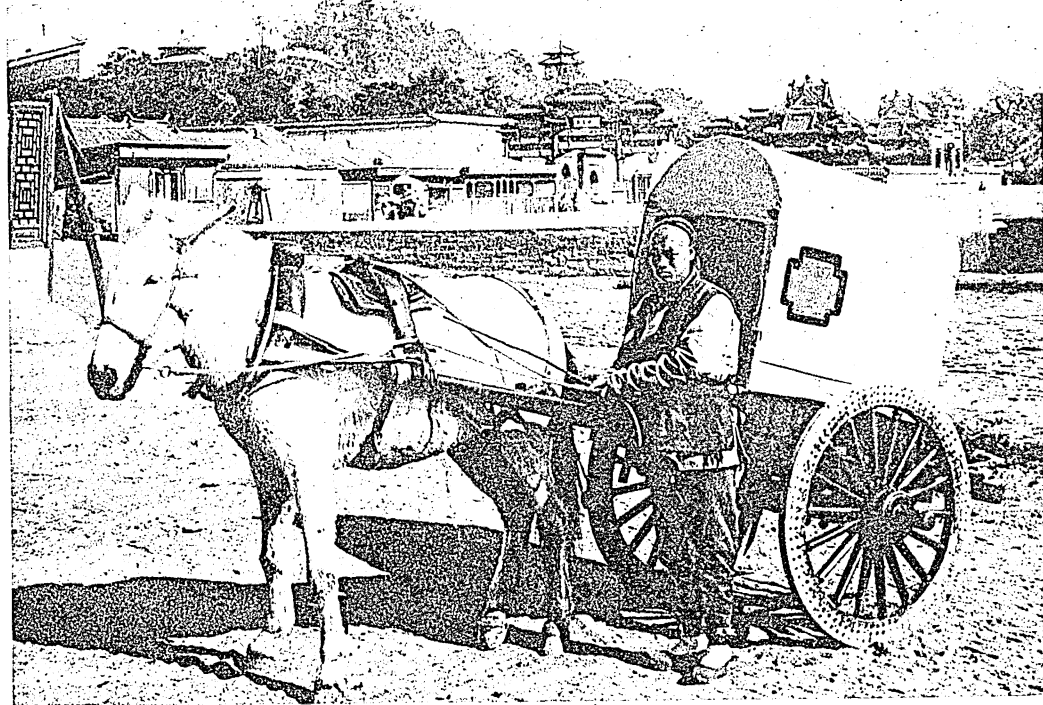
PART OF THE GREAT WALL OF CHINA



A WIDE AND STRAGGLING STREET IN PEKING



SAMPANS IN THE RIVER AT SHANGHAI, THE GREAT CHINESE SEAPORT



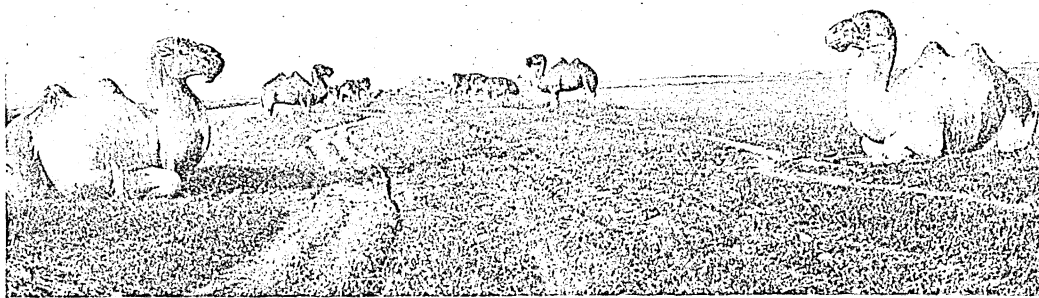
A TYPICAL CHINESE COACH IN A PEKING STREET



A FINE STREET IN SHANGHAI



THE SPLENDID BUILDINGS OF PEKING



THE GREAT STONE ANIMALS GUARDING THE APPROACH TO THE MING TOMBS



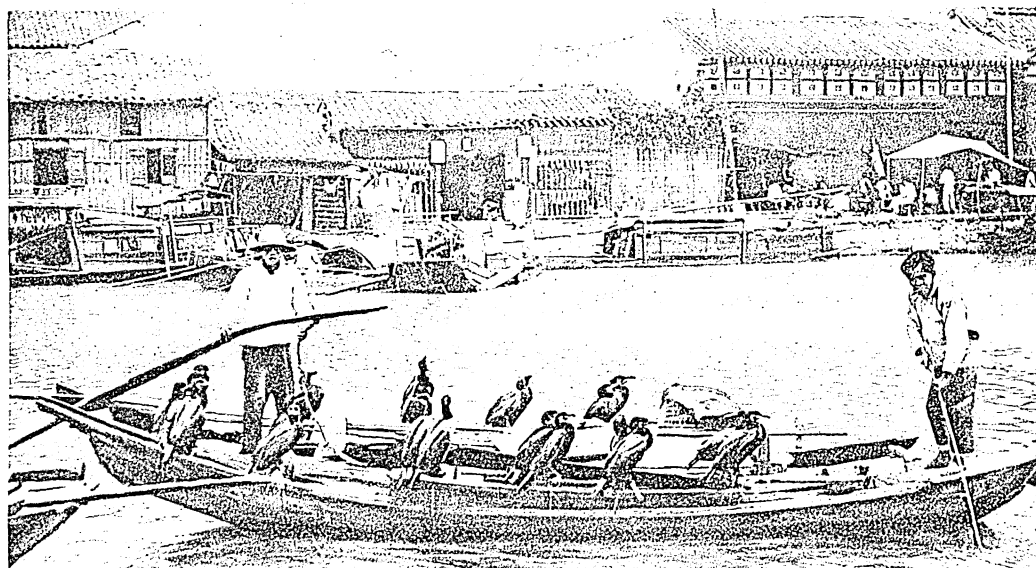
AN OLD MANDARIN READS HIS PAPER



A BRONZE LION AT THE OLD IMPERIAL PALACE, PEKING



A CHINESE LADY IN NATIVE DRESS



SETTING OUT FOR A FISHING EXPEDITION WITH CORMORANTS TRAINED TO CATCH THE FISH

CHINA THE HOME OF 300 MILLIONS

China proper is, politically, a Republic, with a parliamentary Government meeting in Peking, and trying to weld into a single whole eighteen provinces, each governed by a military officer called a Tuchun, who is assisted by civil officials all appointed by the Government. But in the south of the country, with Canton as its capital, is a second Republican Government with a different president from the Peking Government. Foreign countries treat only with the Peking administration, which appoints the diplomatic staff. This central Government, however, obviously does not control either the southern part of the country, or all the Tuchuns who govern the provinces individually, each according to his own ideas, and the extent of his military power.

The result is that orderly government is far from general. Brigandage is rife, and is carried on by soldiers who have disbanded themselves because they are not paid. The Tuchuns who pay their men and rule firmly, get the necessary money from the people of their province as best they can, and the central government has empty coffers. The spectacle is saddening. An ancient people, trying to get into step with the modern world, is confused, and cannot find leaders with organising power. China needs an uncorruptible great man, who knows the world, and will serve his country for love of her. Till she gets him she will welter in confusion and disorder.

China has a written history going back for 4000 years—more than twice as long as ours. She had a start of 2000 years before the nations of Western Europe. Why has she lost it? One reason is that the Chinese by religion and custom have a profound reverence for their ancestors, and make it a duty to carry on the work of life in the ways handed down by their forefathers. For long centuries, too, they shut themselves off from the rest of the world in the firm belief that they were a superior race, with nothing to learn from the despised foreigner.

But those ideas are now passing away to a considerable extent. Customs of former times that acted as fetters are being given up. Knowledge is being sought from all the world. Education on scientific lines is diligently pursued by Chinese students in many of the Universities of Europe and America. Release from the bondage of the past has reached numbers of educated Chinese women through the school methods

of the West. Christianity has made remarkable headway in some districts, especially along the lines of medical service. Men's souls have been reached through their bodies, by the practical preaching of the hospitals. Industry is becoming more scientific where European and Japanese influences are felt. The failure has been in assimilating the new methods with the old traditions, and especially in organising man power on a national scale to meet present-day needs.

The country itself has great resources. From the highlands of Tibet and Yunnan it receives great rivers which, as they reach the fertile plains, are linked together by a canal system that was partly in existence before Caesar's invasion of Britain. The chief of these rivers, the Yang-tse-kiang, rises in Tibet, reaches the Chinese plain through magnificent mountain gorges, and for 1000 miles of its 3000-mile course is navigable for steamers. It forms lakes which hold up its waters in times of flood, and so prevent devastation. Its waters bring down fertilising mud in which the rice is grown that feeds China's almost countless millions. The Pe-ling Range on the north and the Nan-ling Range on the south define the basin of this life-giving river. On its banks are towns with large populations, as Nanking with 900,000, Kiukiang with 380,000, Chin-kiang with 500,000, Hankow with 290,000, and Ichang with 450,000.

It may be well to point out here that the repelling Chinese names are simplified somewhat if we know that ho, kiang, and kong all mean river; chan, shan, and ling all mean mountain; pe, nan, tong (or tung), and si are the points of the compass: north, south, east, and west; hwang (or hoang) is yellow, the special colour of China; pei is white; fu (or foo) and kin or king mean town or court; hai is sea; and chian is heaven. So Pe-ling means northern mountains, and Peking, northern capital or court; Nan-ling southern mountains, and Nanking southern court or capital; and Hwang-ho is yellow river.

The Hwang-ho, China's second greatest river, rises like the Yang-tse-kiang, in Tibet. It has a course of 2400 miles. Its name, Yellow River, is appropriate because of the vast amount of sand and yellow mud brought by it from the part of its course, where it skirts the deserts of Mongolia. The name, in fact, is also given

to the sea into which the river empties, the Yellow Sea. The river is almost useless for navigation. Its mouth is barred by sandbanks; its stream is shallow in winter, and too swift for navigation when swollen by the melting snows around its source in summer, and its liability to then burst its banks, and flood the Chinese plain, has given it the name of "China's Sorrow." Ten times the Hwang-ho has changed its course, with terrible destruction to life and property. It is estimated that one of its inundations cost a million lives.

THE GREAT WEST RIVER THAT RUNS FOR A THOUSAND MILES

The Si-kiang or West River, in southern China, that reaches the sea at Canton, has a better record. It rises in the province of Yunnan, bordering on French Tonking and Burma, and has a course of 1000 miles, of which 200 miles is navigable to the town of Wuchow (350,000).

The population of China is not only dense along its river courses, but it is great on the sea-coast, the ports having populations unapproached by other countries. Peking, the capital inland, with its population of 1,200,000, is far from being the largest city in numbers. The Chinese census gives Ningpo with 2,200,000, Wenchow 1,750,000, Shanghai 1,600,000, Foochow 1,500,000, Canton 1,370,000, and Soochow 1,100,000; and all these are seaports, while there are more than a dozen other Treaty ports open to foreign trade.

Though China is in the main an agricultural country its relation to industry must not be undervalued. Coal is found in all the provinces and it is being extensively mined. Iron is abundant. Yunnan province is rich in copper and tin. Sixty per cent. of the world's antimony comes from China. Gold, silver, lead, and oil are being worked. The country, too, is developing the manufactures that depend on its raw materials. It has iron and steel works, and glass factories, cotton mills, and it is beginning to mill its own flour, particularly its Manchurian wheat.

THE WIDE RANGE AND VARIETY OF PLANTS THAT GROW IN CHINA

The agricultural products with which China is popularly credited are tea and rice. The tea trade has declined somewhat under Indian competition, and the exportation of rice is not allowed. China imports rice. Her most expanding growths are cotton, beans, and wheat. She supplies a quarter of the world's silk. The

variety of her climate gives her a wide range of plant life products—from barley to sugar. In the growth of vegetables of all kinds the Chinese are specially expert. It is to be feared that the opium which has been excluded as an import from India is now cultivated in China itself.

As a seafaring people the Chinese have always been adventurous on a small scale. As early as the sixteenth century Chinese ships were trading as far westward as the Red Sea, and at the present a quarter of the country's trade by sea is carried on in Chinese ships, or about the same amount that is carried in Japanese ships, while British ships carry about 40 per cent. of the total mercantile marine.

As traders the better-class Chinese, merchants and bankers, have a high repute throughout the world for integrity.

China, judged by the resources of her territories, and by the industry of all, and the intelligence of many of her people, should play a great part in the world if ever she develops the gift of organisation, industrially and politically.

THE GREAT BURNING OF THE BOOKS OF CONFUCIUS

The early history of the country, though it is amply recorded in legend and in more sober records, is but dimly known to the civilised West. The national character was apparently moulded in a large degree by the great teacher Confucius, who, during his wandering and hard life, tried to find out how best a man could do his duty to his neighbour, and how best he could learn to govern himself. His teachings have been law to countless millions of his fellow-countrymen, his temples are found all over China, and his books have been the foundation of all learning through the centuries—for Confucius collected and set in order the history of the Empire, and inspired a great many books in which his teachings are set forth.

A few hundred years after his death, a prince of China reigned who ordered a great burning of the books of Confucius, and cruelly treated those who tried to keep them. One punishment was to send them to labour on a great wall he was building right across the north of China, to keep out the Mongolian horsemen, who were for ever descending on his country. Thirty feet high, fifteen feet wide at the top, faced with granite, with many towers of defence, this wonderful wall runs over hill and valley, across

CHINA AND HER NEIGHBOURS

sand and river, up the face of the rocks, for 1500 miles; but it did not keep the Mongols out.

More than a hundred years before the birth of Christ trade was opened up with Central Asia by China, and caravans began to wind along the routes from one oasis to another across the deserts, through the passes of Mongolia and

new homes across the North Sea, that the Buddhist religion took hold in China, though it had been introduced from India some centuries before. Temples were built all over the country to house the thousands of images that were brought by the priests and monks.

The three centuries after this are considered by the Chinese as one of the most



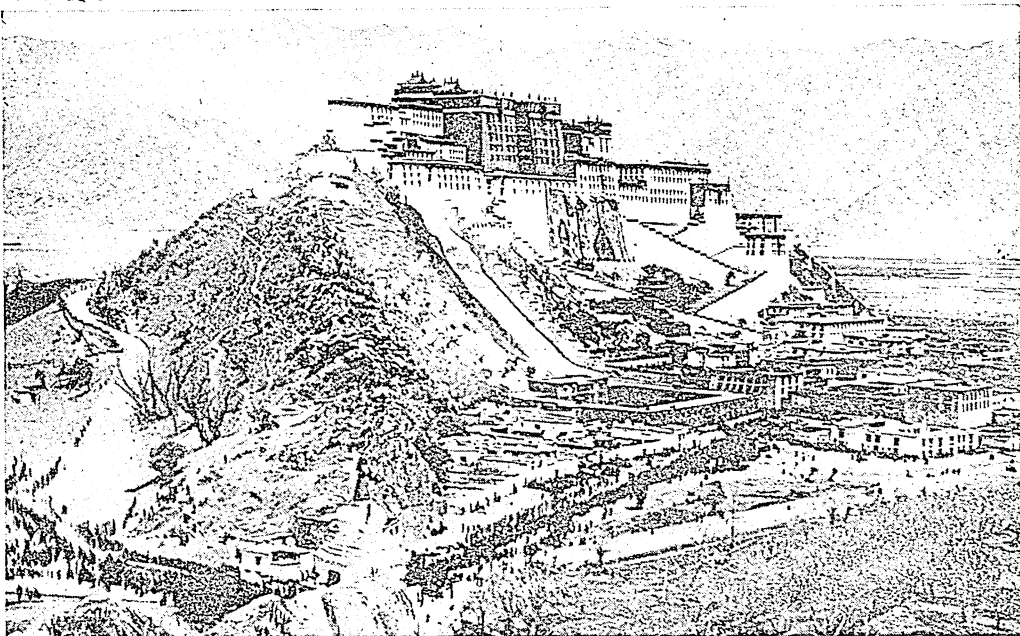
A MANCHURIAN NOBLEMAN



HAPPY BOYS OF MUKDEN



A LAMA OF TIBET



THE HOME OF THE DALAI LAMA ON A HILLTOP AT LHASA, THE CAPITAL OF TIBET

Turkestan to Tibet, carrying goods by the labour of men and dumb animals.

Later, the Empire suffered from many disturbances and divisions, and the struggles among several small rulers to be first and foremost. It was during these centuries, about the times when the Angles and Saxons were seeking their

glorious periods in their long history. Examinations and degrees occupied a great place in public life. About the time when King Alfred was setting scholars laboriously to work with their pens and paint-brushes to copy manuscripts, Chinese records mention the printing of books by wooden blocks. About this time,

too, an immense encyclopedia was written. The fame of this learning and of the gorgeous palaces and riches of China was spread to Europe, chiefly by Arab traders, and ever since the romance and mystery of China has attracted the imagination and longing of the West.

HOW MARCO POLO OPENED THE DOOR TO THE FAR EAST

But it was not till the thirteenth century that the famous Marco Polo opened the door for Europe to get a passing view of the wonders of the dim and mysterious land of the Far East.

Early in that century the Mongols had gradually been getting more and more power on the borders of Central Asia and in the north of China. When the great leader, Jenghiz Khan, the "Greatest of the Great," flashed over western Asia and ruled over an empire stretching from the China Sea to Russia, some of the barriers that had hitherto prevented entry into China were swept away. The huge Empire was divided at his death among his sons, and a good deal of intercourse followed between China and Persia, Tibet and Mongolia.

It was the grandson of Jenghiz Khan, Kublai Khan, who welcomed Marco Polo, the Venetian traveller, to China, and sent him on many missions to the wild provinces on the borders of Tibet and other distant parts of the Empire. Deeply interesting is the account of Kublai's reign by Marco Polo. Kublai added southern China to his dominions, and made his new capital at Peking, the Court of the north. This great soldier was also a great ruler, for he encouraged education and helped China in many ways.

THE END OF THE RULE OF THE MONGOLS IN CHINA

His grandson, Timur, or Tamerlane, was the last of the great Mongol rulers. He gave an order that Confucius should be held in great respect. After his death, rebellions and murders of emperors, great misgovernment, and other troubles brought the rule of the Mongols to an end. In the fifteenth century the Chinese drove them across the Great Wall to the Altai Mountains, and Mongolia became a province of the Empire under the Chinese Ming family, or dynasty, of emperors, which lasted nearly 300 years.

Very beautiful porcelain was made during the Ming dynasty, and another large encyclopedia was brought out, which

occupied many editors and assistants for several years. It is said that this is the largest encyclopedia in the world. It runs to many thousands of volumes, and a copy of the first edition is to be seen in the British Museum. There are many splendid remains of the great Ming dynasty in China, especially near Peking. As the Ming dynasty was nearing its end, the Manchus, who were descendants of old Mongolia and enemies of China, settled in Manchuria, made increasingly successful attacks on the Empire till, in 1616, the Manchu line of rulers found themselves firmly seated on the throne, beyond the Great Wall that was built centuries before to keep out invaders. China was ruled by emperors of the Manchu dynasty till 1912.

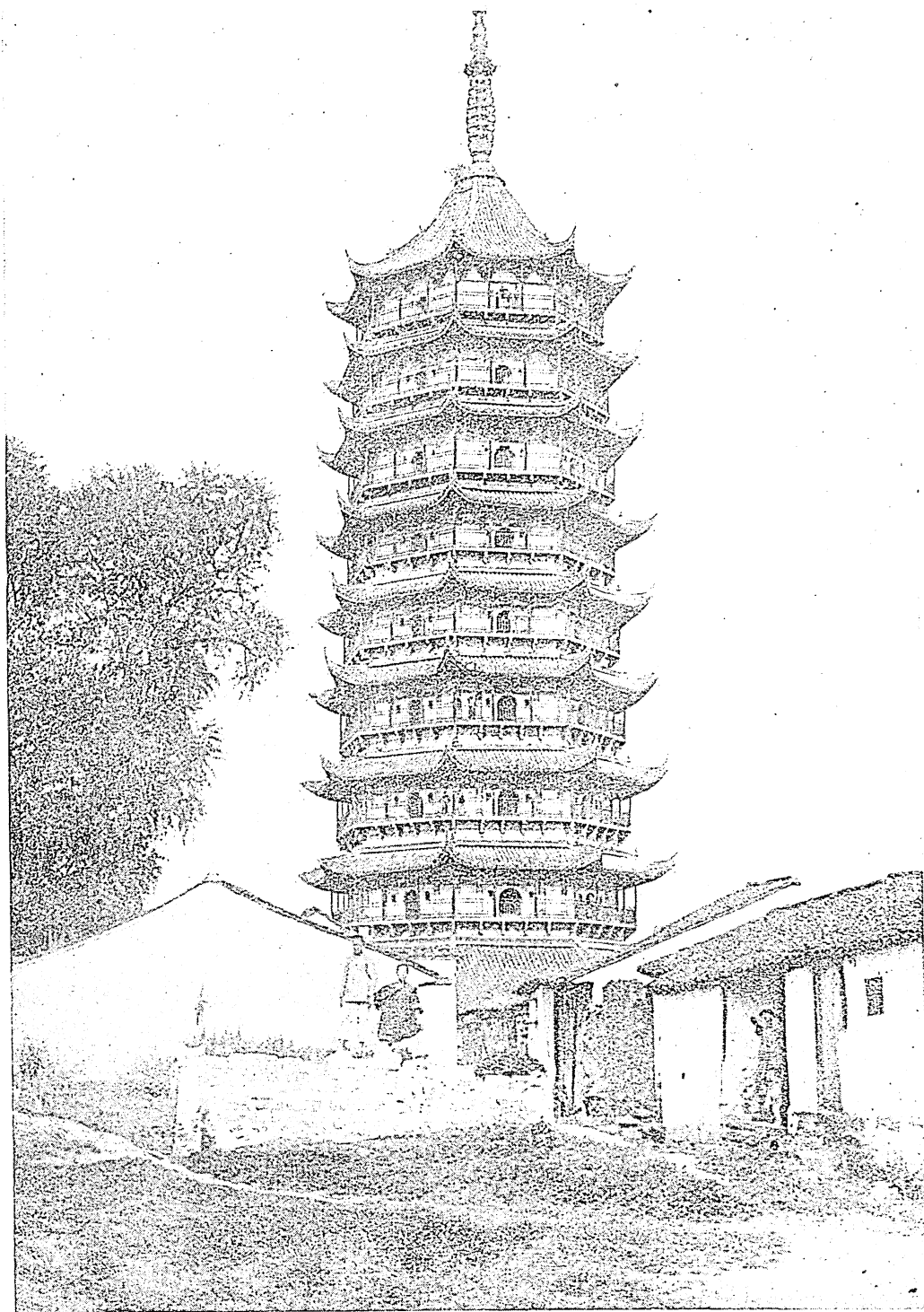
It was in 1842 that, by the Treaty of Nanking, certain treaty ports were opened to foreign trading ships, and since then opportunities for trading and for visiting the country have been constantly enlarged. Shortly after the Nanking Treaty a terrible rebellion devastated a large part of China for fifteen years. In 1864 the British helped the government to restore order, and General Gordon, often afterwards called "Chinese" Gordon, took a part in suppressing the rebellion.

CHINA CHANGES ITS GOVERNMENT AFTER THOUSANDS OF YEARS

In 1900 a great rising—called the Boxer rising—took place, and foreigners everywhere were attacked. The embassies of the different nations were besieged in Peking; but they held their own against the mob until a mixed force from the leading European armies and the United States reached the city, and order was restored without very great loss of life.

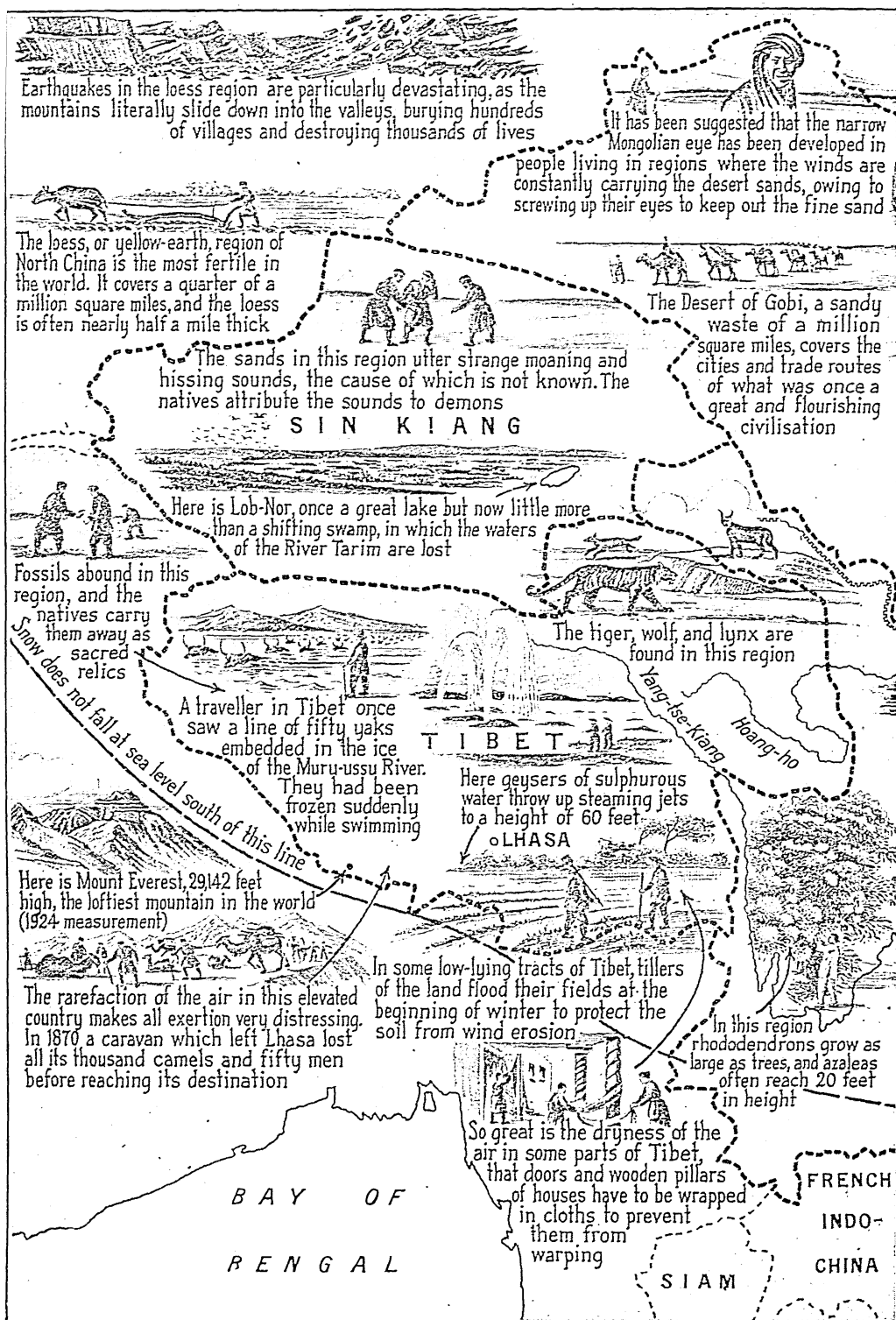
The relations between Russia and China, and Japan and China in recent years have been referred to already. A great surprise fell on the world when in 1912 it was announced that the Emperor, a boy of six, had abdicated and decided that a Republic should be formed. Of course, this step was taken on behalf of the child by his guardians. So far the task of modernising this ancient conservative land, and governing it on democratic lines, has been greater than the Chinese who have had a modern education have been able to cope with. Only Time can make the necessary changes with wisdom and humanity, but in grappling with that task Chinese statesmen and patriots have the sympathy of the whole civilised world.

PICTURE ATLAS CHINA AND HER NEIGHBOURS



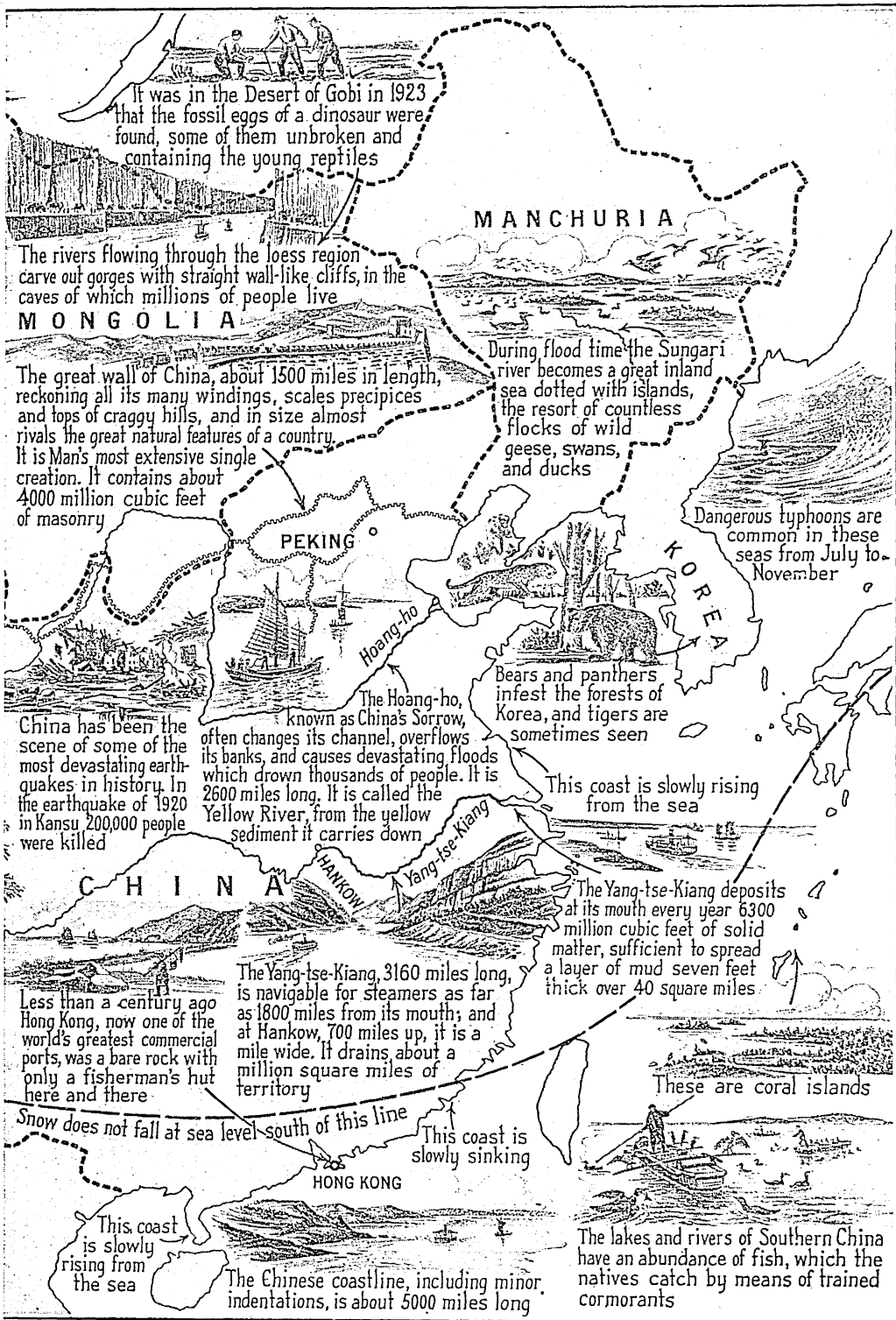
THE SYMBOL OF THE EAST—THE GREAT PAGODA OF SOOCHOW WHICH HAS STOOD AS WE
SEE IT FOR NEARLY 800 YEARS

THE FACE OF THE EAST—NATURAL FEATURES



THOUGH CHINA IS A WELL-WATERED COUNTRY THE LANDS ON ITS WEST ARE FAST DRYING UP:

OF CHINA AND THE SURROUNDING LANDS



CENTURIES AGO GREAT CITIES FLOURISHED IN AREAS THAT ARE NOW SAND-RIDDEN DESERTS

THE ANIMALS OF CHINA AND NEIGHBOURING



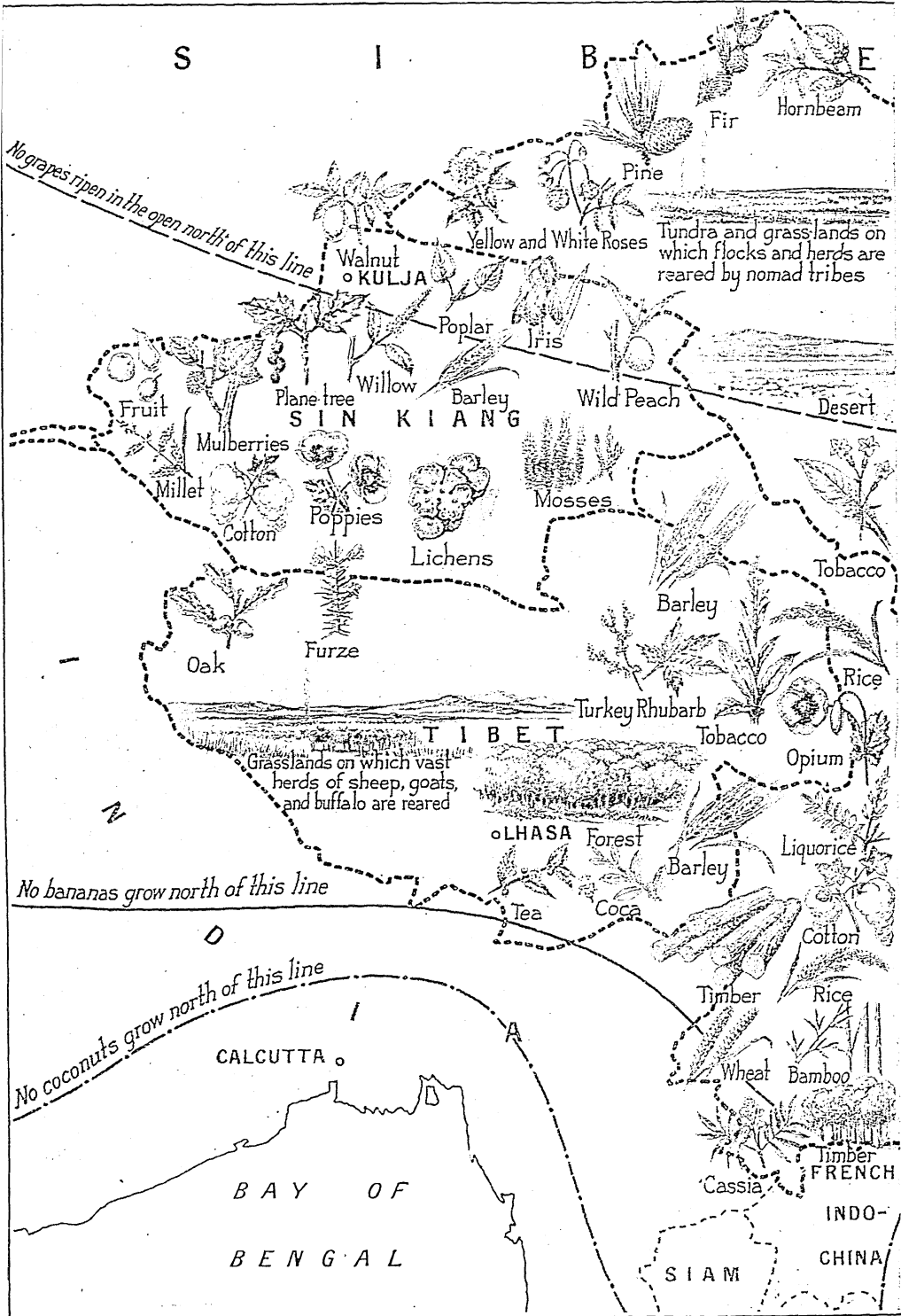
CHINA AND THE COUNTRIES WHICH JOIN IT IN THE NORTH AND SOUTH HAVE MANY WILD

LANDS, WITH THE FISH OF THE CHINA SEAS



ANIMALS, INCLUDING THE TIGER, WOLF, RHINOCEROS, CROCODILE, PORCUPINE, AND BEAR

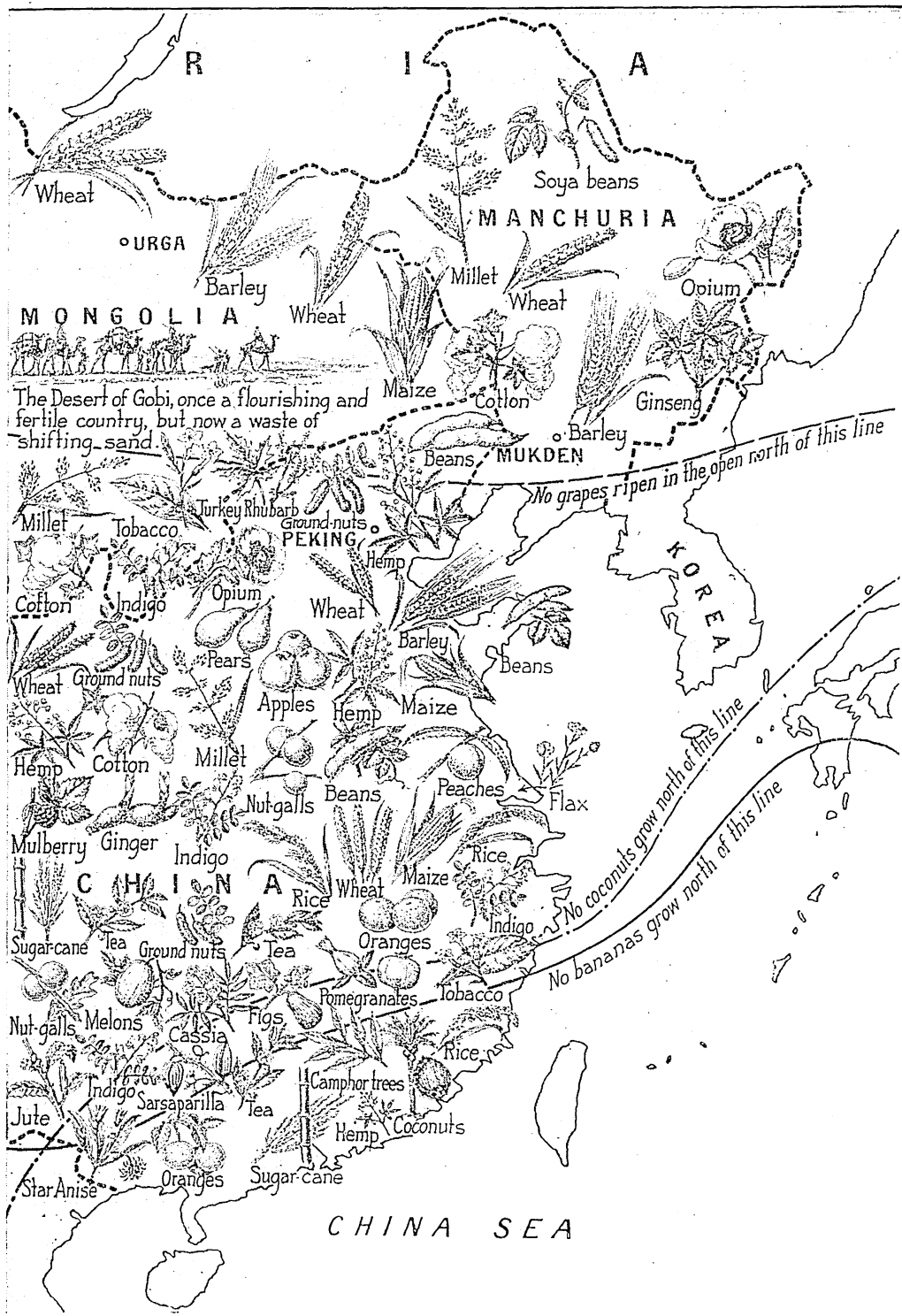
THE INTERESTING PLANT LIFE OF CHINA AND



CHINA'S VEGETATION IS AS VARIED AS ITS CLIMATE AND INCLUDES MANY PLANTS USEFUL AS

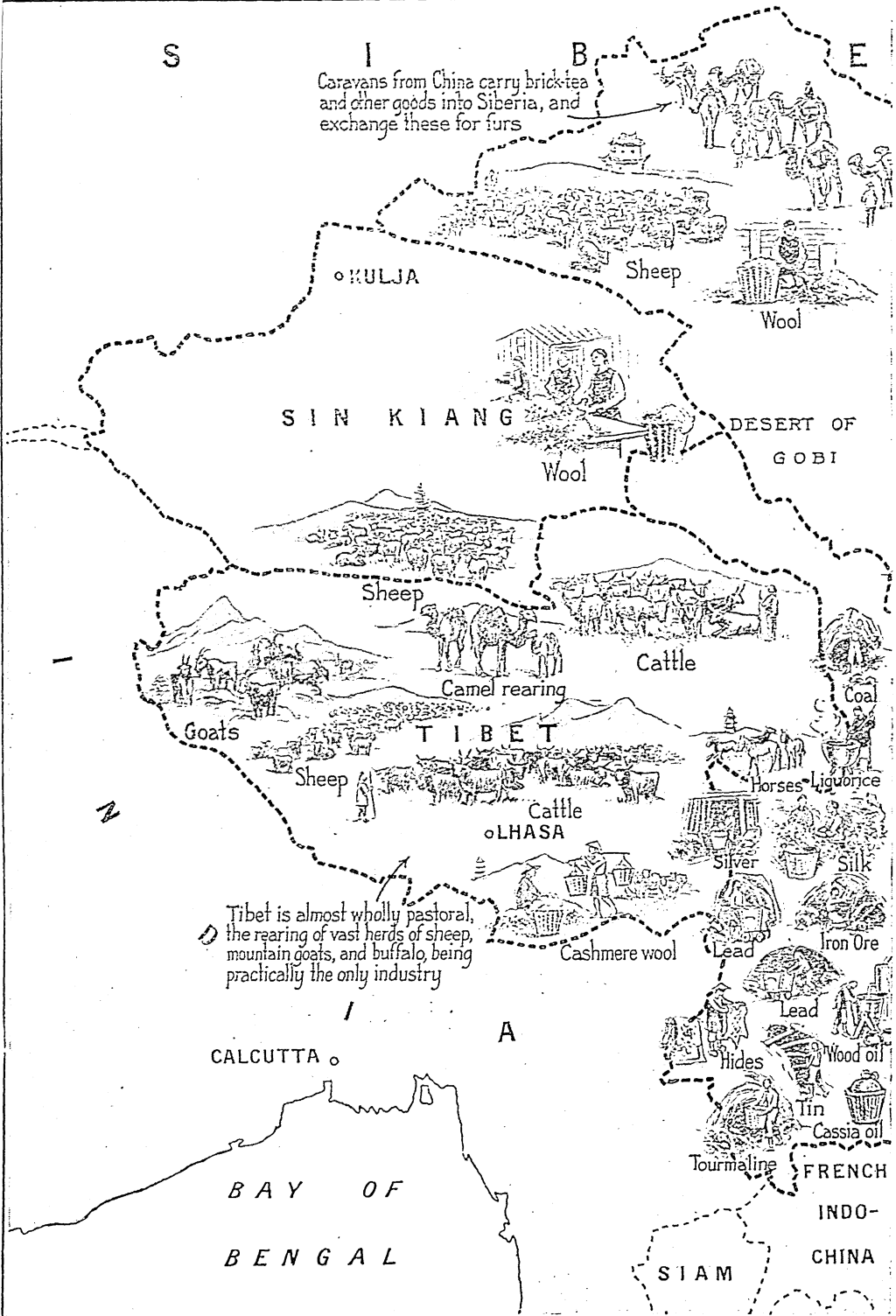
6518

THE COUNTRIES THAT TOUCH ITS BORDERS



FOODS, MEDICINES TEXTILES AND TIMBERS. TEA ALTHOUGH CULTIVATED. DOES NOT GROW WILD

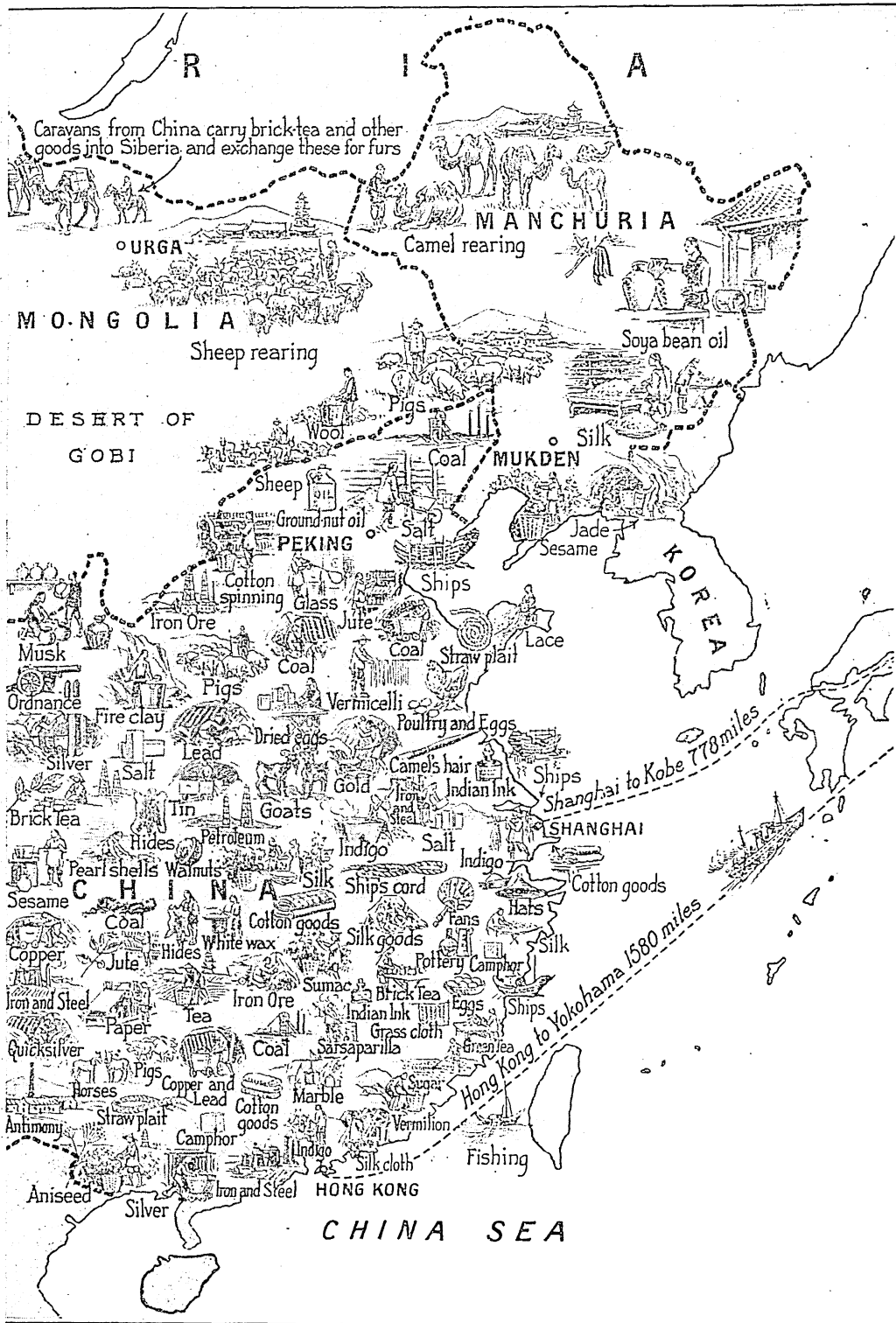
THE INDUSTRIES OF A CROWDED AND BUSY



THERE IS NO MORE INDUSTRIOUS PEOPLE IN THE WORLD THAN THE CHINESE. AND THIS

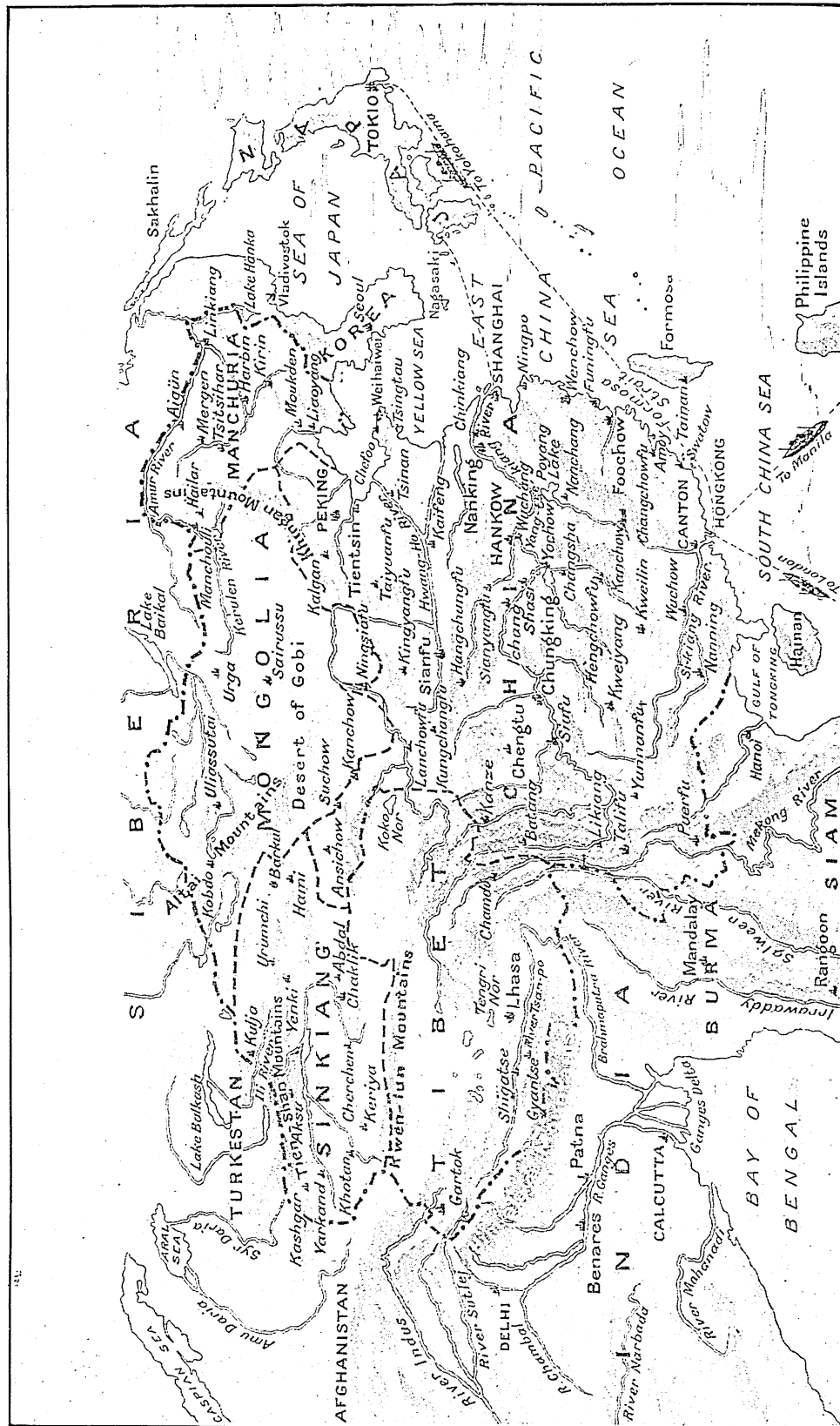
6520

LAND—CHINA AND THE WORK HER PEOPLE DO



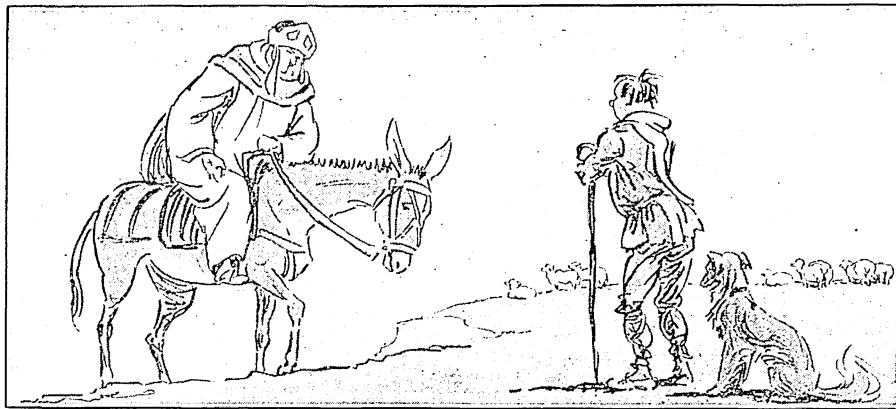
PICTURE-MAP SHOWS MANY OF THE INDUSTRIES THAT BRING WEALTH TO THE NATION
6521

CHINA AND THE COUNTRIES LYING ROUND ABOUT ITS BORDERS



CHINA ONCE RULED TIBET, SINKIANG (OR CHINESE TURKESTAN), MONGOLIA, AND MANCHURIA, BUT NOW THESE ARE MORE OR LESS INDEPENDENT

One Thousand Poems of All Times and All Countries



THE KING AND THE ABBOT

This is a very old and once extremely popular story in rhyme. Its proper title is King John and the Abbot of Canterbury, but the tale it tells is, of course, to be regarded entirely as fiction. There are endless stories of a similar

AN ancient story I'll tell you anon
Of a notable prince that was called
King John ;
And he ruled England with main and with
might,
For he did great wrong and maintained
little right.

And I'll tell you a story, a story so merry,
Concerning the Abbot of Canterbury ;
How for his housekeeping and high renown
They rode post for him to fair London
town.

An hundred men, the King did hear say,
The Abbot kept in his house every day ;
And fifty gold chains, without any doubt,
In velvet coats waited the Abbot about.

"How now, Father Abbot, I hear it of thee
Thou keepest a far better house than me ;
And for thy housekeeping and high renown
I fear thou work'st treason against my
crown."

"My liege," quo' the Abbot, "I would it
were known
I never spend nothing but what is my own ;
And I trust your Grace will do me no deere
For spending of my own true-gotten gear."

"Yes, yes, Father Abbot, thy fault it is
high,
And now for the same thou needest must
die ;

For except thou canst answer me questions
three
Thy head shall be smitten from thy body.

kind, in which three questions have to be answered. The way
in which it is always possible to answer them serves to illus-
trate the resources of human ingenuity. The spelling of the
words in this ballad has been modernised. Deere means harm.

"And first," quo' the King, "when I'm in
this stead,
With my crown of gold so fair on my head,
Among all my liegemen so noble of birth,
Thou must tell me to one penny what I am
worth.

"Secondly tell me, without any doubt,
How soon I may ride the whole world
about.

And at the third question thou must not
shrink,
But tell me here truly what I do think.

"Oh, these are hard questions for my
shallow wit,
Nor I cannot answer your Grace as yet ;
But if you will give me but three weeks'
space
I'll do my endeavour to answer your
Grace."

"Now three weeks' space to thee will I give,
And that is the longest time thou hast to
live ;
For if thou dost not answer my questions
three
Thy lands and thy livings are forfeit to me."

Away rode the Abbot all sad at that word,
And he rode to Cambridge and Oxenford ;
But never a doctor there was so wise
That could with his learning an answer
devise.

Then home rode the Abbot of comfort so
cold,

And he met his shepherd a-going to fold ;

POEMS · SONGS · BALLADS · VERSES AND RHYMES WITH MUSIC

"How now, my lord Abbot, you are welcome home ;
What news do you bring us from good King John ? "

"Sad news, sad news, shepherd, I must give,
That I have but three days more to live ;
For if I do not answer him questions three
My head will be smitten from my body.

"The first is to tell him there in that stead,
With his crown of gold so fair on his head,
Among all his liegemen so noble of birth,
To within one penny of what he is worth.

"The second, to tell him, without any doubt,
How soon he may ride this whole world about ;
And at the third question I must not shrink,
But tell him there truly what he does think."

"Now cheer up, Sir Abbot, did you never hear yet
That a fool he may learn a wise man wit ?
Lend me horse, and serving men, and your apparel,
And I'll ride to London to answer your quarrel.

"Nay, frown not if it hath been told unto me
I am like your Lordship as ever may be ;
And if you will but lend me your gown
There is none shall know us at fair London town."

"Now horses and serving men thou shalt have,
With sumptuous array most gallant and brave,
With crozier, and mitre, and rochet, and cope,
Fit to appear 'fore our father the Pope."

"Now welcome, Sir Abbot," the King he did say,
"Tis well thou'rt come back to keep thy day :
For and if thou canst answer my questions three
Thy life and thy living both saved shall be.

"And first, when thou see'st me here in this stead,
With my crown of gold so fair on my head,
Among all my liegemen so noble of birth,
Tell me to one penny what I am worth."

"For thirty pence our Saviour was sold
Among the false Jews, as I have been told ;
And twenty-nine is the worth of thee,
For I think thou art one penny worser than He."

The King he laughed, and swore by St. Bittel,

"I did not think I had been worth so little !
Now, secondly, tell me, without any doubt,
How soon I may ride this whole world about."

"You must rise with the sun, and ride with the same
Until the next morning he riseth again ;
And then your Grace need not make any doubt
But in twenty-four hours you'll ride it about."

The King he laughed, and swore by St. Jone,

"I did not think it could be gone so soon !
Now, from the third question thou must not shrink,
But tell me here truly what I do think."

"Yea, that shall I do, and make your Grace merry :
You think I'm the Abbot of Canterbury ;
But I'm his poor shepherd, as plain you may see,
That am come to beg pardon for him and for me."

The King he laughed, and swore by the Mass,

"I'll make thee Lord Abbot this day in his place !"

"Now, nay, my liege, be not in such speed,
For, alack, I can neither write nor read."

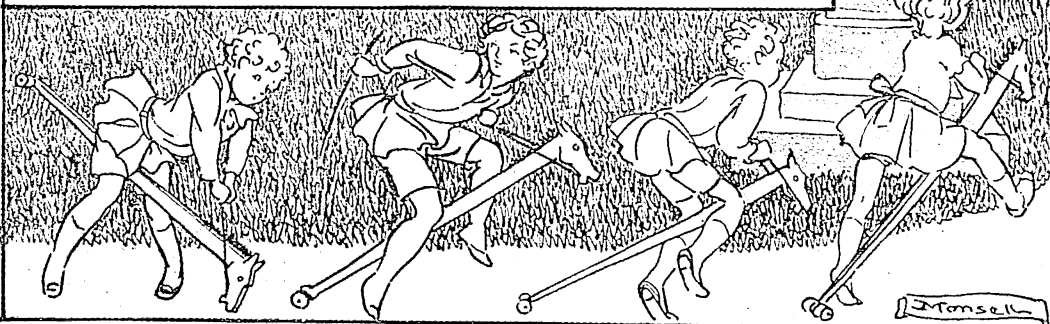
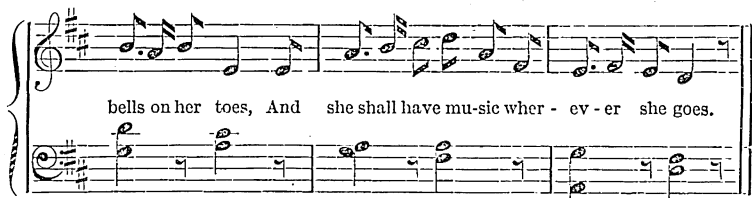
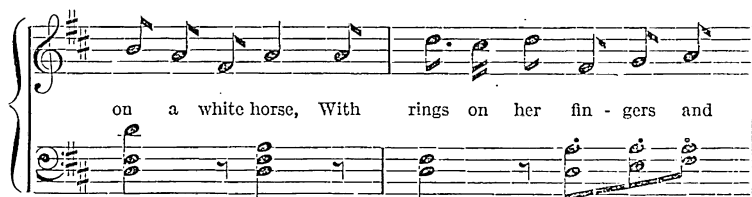
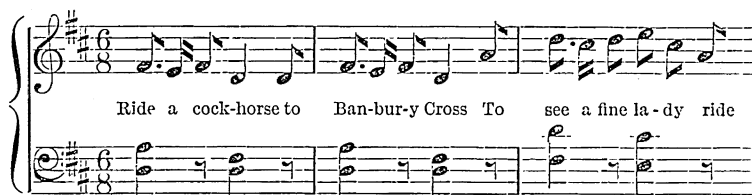
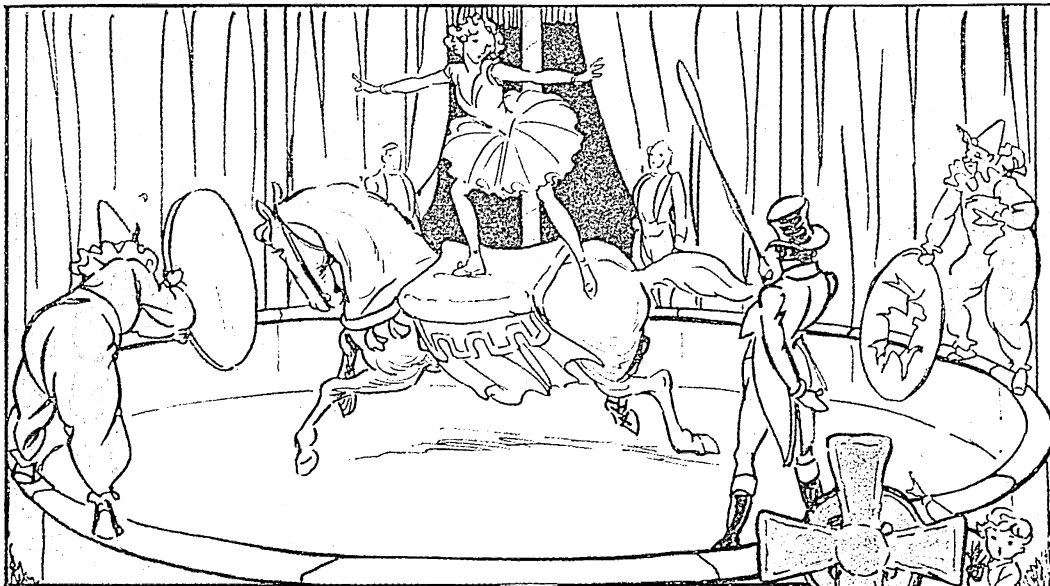
"Four nobles a week, then, I will give thee
For this merry jest thou hast shown unto me ;
And tell the old Abbot, when thou comest home,
Thou hast brought him a pardon from good King John."

TO THE MOON

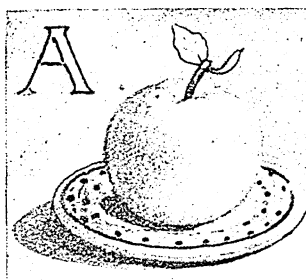
This fanciful picturing of the moon by Shelley is a fragment found among his papers by his wife after his death.

ART thou pale for weariness
Of climbing heaven and gazing on
the earth,
Wandering companionless
Among the stars that have a different
birth,
And ever changing, like a joyless eye
That finds no object worth its constancy ?

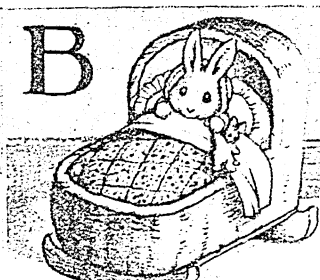
RIDE A COCK-HORSE



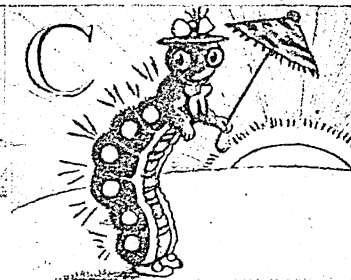
A IS AN APPLE ROUND AND RED



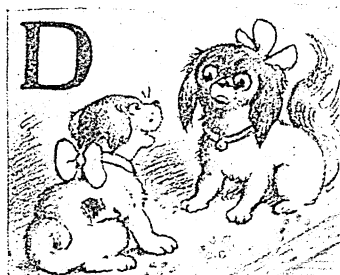
A IS AN APPLE
ROUND AND RED



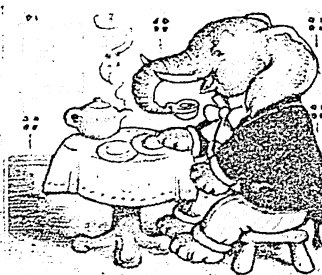
B IS A BUNNY
TUCKED UP IN BED



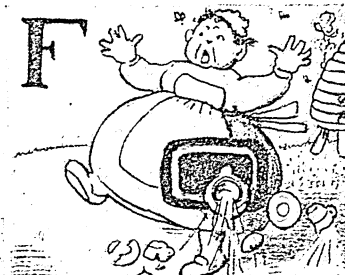
C IS A CATERPILLAR
OUT FOR A WALK



D IS TWO DOGGIES
HAVING A TALK



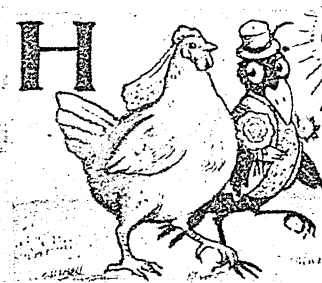
E IS AN ELEPHANT
DRINKING HIS TEA



F IS FOR FANNY
STUNG BY A BEE



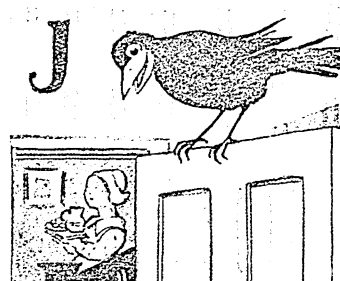
G IS FOR GEORGIE
READING A BOOK



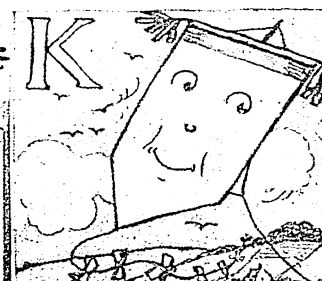
H IS THE HEN THAT
MARRIED A ROOK



I IS THE INK JACK
SPILT ON THE FLOOR



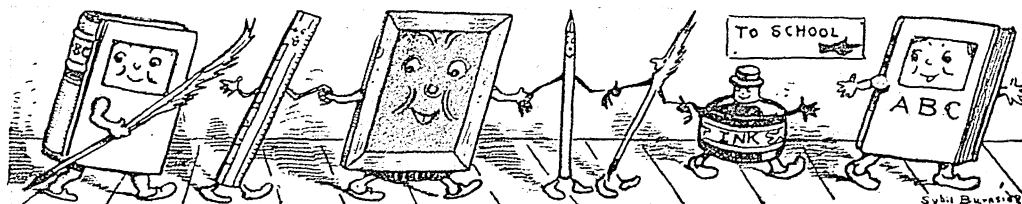
J IS THE JACKDAW
PERCHED ON THE DOOR



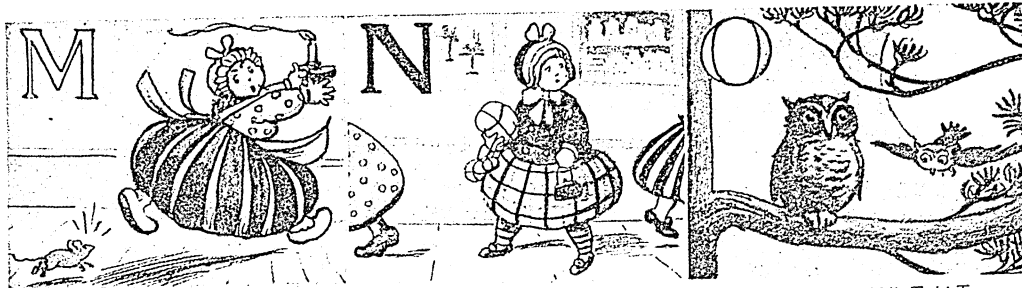
K IS THE KITE THAT
IS FLYING SO HIGH



L IS THE LADY
WHO LIVES NEAR BY



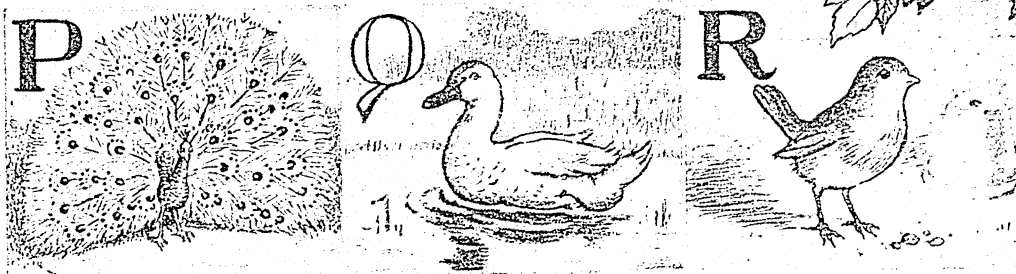
B IS A BUNNY TUCKED UP IN BED



M FOR THE MOUSE
THAT CHASED MRS. BROWN

N IS FOR NANCY
SHOPPING IN TOWN

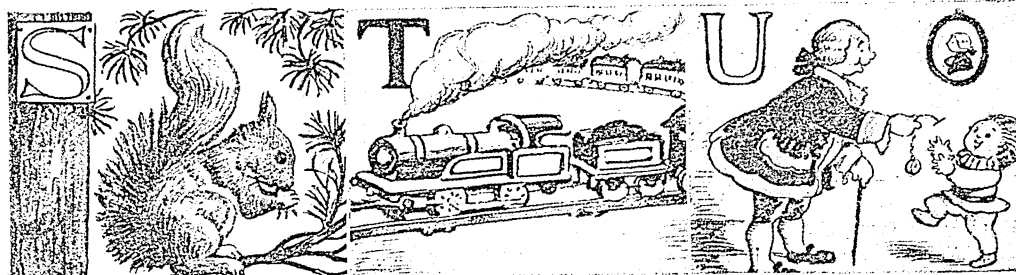
O IS THE OWL THAT
FLIES BY NIGHT



P IS THE PEACOCK THAT
GAVE US A FRIGHT

Q IS THE QUACK-QUACK
THAT SWIMS ON THE LAKE

R IS THE ROBIN THAT
EATS CRUMBS OF CAKE



S IS THE SQUIRREL
THAT LIVES IN OUR TREE

T IS THE TRAIN THAT
BRINGS YOU TO ME

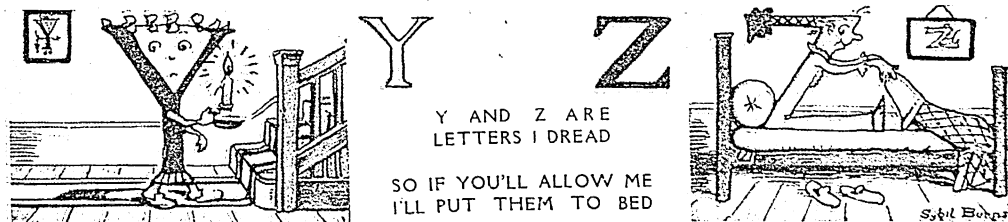
U IS THE UNCLE SO
KIND AND SO SWEET



V IS FOR VERA SO
TRIM AND SO NEAT

W IS A WORM THAT
CRAWLS ON THE GROUND

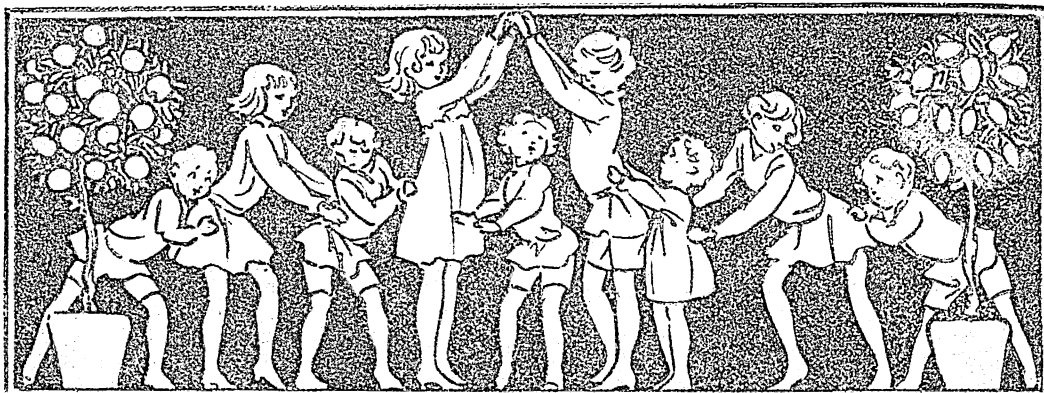
X IS A LETTER THAT
SELDOM IS FOUND



Y AND Z ARE
LETTERS I DREAD

SO IF YOU'LL ALLOW ME
I'LL PUT THEM TO BED

ORANGES AND LEMONS

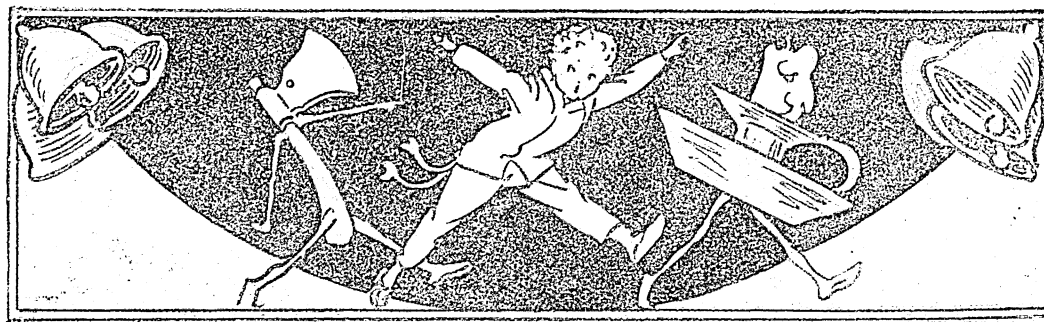


D.C. Oran-ges and le-mons, say the bells of St. Cle-men's, You owe me five farthings, say the
When will that be? say the bells of Step - ney; I do not know, says the

bells of St. Mar - tin's. When will you pay me, say the bells of Old Bai - ley;
great bell of Bow.

D.C.
When I grow rich, say the bells of Shore - ditch; Here comes a can-dle to

light you to bed, And here comes a chop-per to chop off your head.



Imperishable Thoughts of Men Enshrined in the Books of the World

Passages from Shakespeare

WE have looked at the stories of Shakespeare's plays ; here we give a selection of famous passages from them. We can hardly think a thought that Shakespeare cannot match ; we can hardly imagine a situation that something he said does not fit. His language fits all times and his thought all places ; no part of existence, no depth of the universe, no problem of human life, seems outside his range. A poet is no rattle-brain, said Emerson—he does not merely say what comes first, but speaks from a heart in unison with his time and his country. But the wonder of Shakespeare is that his heart beats in unison with all times and all countries.

ARTHUR'S APPEAL TO HUBERT

No story ever printed in books is more deeply moving than the appeal for his eyesight which Shakespeare puts into the mouth of Prince Arthur. The Prince's uncle, King John, had imprisoned the handsome boy ; and Hubert is ordered to put out his eyes. He enters Arthur's room, leaving outside two men bearing hot irons.

Arthur : Good morrow, Hubert.

Hubert : Good morrow, little prince.

Arthur : You are sad.

Hubert : Indeed, I have been merrier.

Arthur : Mercy on me !

Methinks nobody should be sad but I.

So I were out of prison and kept sheep,
I should be merry as the day is long ;
And so I would be here, but that I doubt
My uncle practises more harm to me.

I would to Heaven
I were your son, so you would love me,
Hubert.

Are you sick, Hubert ? You look pale
today :

In sooth, I would you were a little sick ;
That I might sit all night and watch with
you.

I warrant I love you more than you do
me.

Arthur's warm love touches Hubert, and lest he should soften his heart and tear to do the cruel deed Hubert shows the Prince the paper on which his orders are written. Arthur reads it blindly through tearful eyes.

Hubert : Can you not read it ? Is it not
fair writ ?

Arthur : Too fairly, Hubert, for so
foul effect :

Must you with hot irons burn out both
mine eyes ?

Hubert : Young boy, I must.

Arthur : And will you ?

Hubert : And I will.

Arthur : Have you the heart ? When
your head did but ache,
I knit my handkerchief about your
brows—

The best I had, a princess wrought it me—

And I did never ask it you again :

And with my hand at midnight held your
head ;

And, like the watchful minutes to the
hour,

Still and anon cheer'd up the heavy time ;
Saying, What lack you ? and, Where lies
your grief ?

Or, What good love may I perform for
you ?

Many a poor man's son would have lain
still,

And ne'er have spoke a loving word to
you ;

But you at your sick service had a prince.
. Will you put out mine eyes ?

These eyes, that never did, nor never shall,
So much as frown on you ?

Hubert : I have sworn to do it ;
And with hot irons must I burn them out.

Arthur : Ah, none but in this iron age
would do it !

The iron of itself, though heat red-hot,
Approaching near these eyes, would drink
my tears,

And quench this fiery indignation.

Are you more stubborn-hard than ham-
mered iron ?

An if an angel should have come to me,
And told me Hubert should put out mine
eyes,

I would not have believed him ; no
tongue but Hubert's.

Hubert lest he should give way to mercy, summons the attendants with cords and irons. Their fierce looks frighten Arthur, who begs Hubert to send them away.

Arthur : Alas, what need you be so
boist'rous rough ?

I will not struggle, I will stand stone-still.
For Heaven's sake, Hubert, let me not
be bound !

Nay, hear me, Hubert, drive these men
away,

And I will sit as quiet as a lamb ;
 I will not stir, nor wince, nor speak a
 word,
 Nor look upon the iron angrily ;
 Thrust but these men away, and I'll
 forgive you,
 Whatever torment you do put me to.

Hubert sends the men out and bids Arthur prepare himself.

Arthur : Is there no remedy ?

Hubert : None, but to lose your eyes.

Arthur : O Heaven ! That there were
 but a mote in yours,
 A grain, a dust, a gnat, a wandering hair,
 Any annoyance in that precious sense !
 Then, feeling what small things are
 boisterous there,

Your vile intent must needs seem horrible.

Hubert : Is this your promise ? Go
 to, hold your tongue.

Arthur : Hubert, the utterance of a
 brace of tongues
 Must needs want pleading for a pair of
 eyes ;

Let me not hold my tongue ; let me not,
 Hubert !

Or, Hubert, if you will, cut out my
 tongue,

So I may keep mine eyes ; O, spare mine
 eyes ;

Though to no use, but still to look on you !
 Lo, by my troth, the instrument is cold,
 And would not harm me.

Hubert : I can heat it, boy.

Arthur : No, in good sooth ; the fire is
 dead with grief,

Being create for comfort, to be used
 In undeserved extremes : see else your-
 self ;

There is no malice in this burning coal ;
 The breath of heaven hath blown his
 spirit out,

And strew'd repentant ashes on his head.

Hubert : But with my breath I can
 revive it, boy.

Arthur : An if you do you will but
 make it blush

And glow with shame of your proceedings,
 Hubert ;

All things that you should use to do me
 wrong,

Deny their office ; only you do lack
 That mercy which fierce fire and iron
 extends.

Hubert : Well, see to live ; I will not
 touch thine eyes

For all the treasure that thine uncle owes :
 Yet am I sworn and I did purpose, boy,

With this same very iron to burn them
 out.

Arthur : O, now you look like Hubert !

All this while

You were disguised.

Hubert : Peace : no more. Adieu ;
 Your uncle must not know but you are
 dead !

I'll fill these dogged spies with false
 reports.

And, pretty child, sleep doubtless and
 secure,

That Hubert, for the wealth of all the
 world,

Will not offend thee.

Arthur : O Heaven ! I thank you,
 Hubert.

THE LESSON OF THE HONEY BEES

So work the honey bees ;

Creatures that, by a rule in Nature,
 teach

The act of order to a peopled kingdom.

They have a king and officers of sorts ;

Where some, like magistrates, correct at
 home ;

Others, like merchants, venture trade
 abroad ;

Others, like soldiers, armed in their stings,
 Make boot upon the summer's velvet buds,

Which pillage they with merry march
 bring home

To the tent-royal of their emperor ;

Who, busied in his majesty, surveys

The singing masons building roofs of gold ;

The civil citizens kneading up the honey ;

The poor mechanic porters crowding in

Their heavy burdens at his narrow gate ;

The sad-eyed justice, with his surly hum,
 Delivering o'er to executors pale

The lazy, yawning drone. Henry V

WHAT MUST THE KING DO NOW ?

WHAT must the king do now ? Must he
 submit ?

The king shall do it ; must he be deposed ?

The king shall be contented ; must he lose

The name of king ? o' God's name, let it
 go ;

I'll give my jewels for a set of beads,

My gorgeous palace for a hermitage,

My gay apparel for an almsman's gown,

My figured goblets for a dish of wood,

My sceptre for a palmer's walking-staff,

My subjects for a pair of carved saints,

And my large kingdom for a little grave,

A little little grave, an obscure grave ;

Or I'll be buried in the king's highway,

Some way of common trade, where sub-
 jects' feet

May hourly trample on their sovereign's
head ;
For on my heart they tread now whilst I
live ;
And buried once, why not upon my head ?

Richard II

ADVICE OF POLONIUS TO LAERTES

Give thy thoughts no tongue,
Nor any unproportioned thought his act.
Be thou familiar, but by no means vulgar ;
The friends thou hast, and their adoption
tried,
Grapple them to thy soul with hoops of
steel ;
But do not dull thy palm with entertain-
ment
Of each new-hatched, unfledged comrade.

Beware

Of entrance to a quarrel, but, being in,
Bear't that th' opposed may beware of
thee.

Give every man thine ear, but few thy
voice ;

Take each man's censure, but reserve thy
judgment.

Costly thy habit as thy purse can buy,
But not expressed in fancy ; rich, not
gaudy ;

For the apparel oft proclaims the man,
And they in France of the best rank and
station

Are most select and generous, chief in that.
Neither a borrower, nor a lender be ;
For loan oft loses both itself and friend,
And borrowing dulls the edge of husbandry.
This above all : to thine own self be true,
And it must follow, as the night the day,
Thou canst not then be false to any man.
Farewell ; my blessing season this in thee !

Hamlet

THE SHEPHERD'S HAPPY LIFE

O GOD ! methinks it were a happy life
To be no better than a homely swain ;
To sit upon a hill, as I do now,
To carve out dials quaintly, point by point,
Thereby to see the minutes, how they run :
How many make the hour full complete ;
How many hours bring about the day ;
How many days will finish up the year ;
How many years a mortal man may live.
When this is known, then to divide the
times :

So many hours must I tend my flock ;
So many hours must I take my rest ;
So many hours must I contemplate ;
So many hours must I sport myself ;
So many days my ewes have been with
young ;

So many weeks ere the poor fools will ean ;
So many years ere I shall shear the fleece :
So minutes, hours, days, months, and
years,

Passed over to the end they were created,
Would bring white hairs unto a quiet grave.
Ah, what a life were this ! how sweet !
how lovely !

Gives not the hawthorn bush a sweeter shade
To shepherds, looking on their silly sheep,
Than doth a rich embroidered canopy
To kings that fear their subjects' treachery ?
O, yes, it doth ; a thousand-fold it doth.

And to conclude—the shepherd's homely
curds,

His cold, thin drink out of his leather bottle,
His wonted sleep under a fresh tree's shade,
All which secure and sweetly he enjoys,
Is far beyond a prince's delicates,
His viands sparkling in a golden cup,
His body couched in a curious bed,

When care, mistrust, and treason wait on
him.

Henry VI

THE FALL OF CARDINAL WOLSEY

One of the greatest characters in the long roll of English
history is Cardinal Wolsey, who controlled the kingdom
during the early years of the reign of Henry the Eighth.
He was a tyrant, unjust in many ways, but a patriot for all.

FAREWELL, a long farewell, to all my
greatness !

This is the state of man ; today he puts
forth

The tender leaves of hope ; tomorrow
blossoms,

And bears his blushing honours thick upon
him :

The third day comes a frost, a killing frost ;
And when he thinks, good easy man,
full surely

His greatness is a-ripening—nips his root,
And then he falls, as I do. I have ventured,

that ; and when the king dismissed him from his high office it
is thus that Shakespeare imagines him to have received the
crushing blow. The Cromwell mentioned is not Oliver Crom-
well, of course, but Thomas Cromwell, Wolsey's secretary.

Like little wanton boys that swim on
bladders,

This many summers in a sea of glory,
But far beyond my depth : my high-blown

pride
At length broke under me ; and now has

left me ;
Weary and old with service, to the mercy

Of a rude stream, that must for ever hide me.
Vain pomp and glory of this world, I hate
ye ;

I feel my heart new opened : O, how
wretched

Is that poor man that hangs on princes'
favours!
There is, betwixt that smile we would
aspire to,
That sweet aspect of princes, and their
ruin,
More pangs and fears than wars or women
have;
And when he falls, he falls like Lucifer,
Never to hope again.

Enter Cromwell

Why, how now, Cromwell?

Cromwell: I have no power to speak, sir.

Wolsey: What, amazed

At my misfortunes? Can thy spirit
wonder

A great man should decline? Nay, an you
weep,

I am fallen indeed.

Cromwell: How does your Grace?

Wolsey: Why, well;

Never so truly happy, my good Cromwell.
I know myself now; and I feel within me
A peace above all earthly dignities,
A still and quiet conscience. The king has
cured me,

I humbly thank his Grace; and from these
shoulders,

These ruined pillars, out of pity taken

A load would sink a navy, too much
honour;

O, 'tis a burden, Cromwell, 'tis a burden
Too heavy for a man that hopes for heaven.

Cromwell: I am glad your Grace has
made that right use of it.

Wolsey: I hope I have: I am able
now, methinks,

Out of a fortitude of soul I feel,
To endure more miseries and greater far
Than my weak-hearted enemies dare offer.

Go, get thee from me, Cromwell;
I am a poor fallen man, unworthy now
To be thy lord and master: seek the king;
That sun, I pray, may never set! I have
told him

What, and how true thou art: he will
advance thee;

Some little memory of me will stir him
(I know his noble nature) not to let
Thy hopeful service perish too. Good
Cromwell,

Neglect him not; make use now, and
provide

For thine own future safety.

Cromwell: O, my lord,
Must I then, leave you? Must I needs
forego

So good, so noble, and so true a master?

Bear witness, all that have not hearts of
iron,
With what a sorrow Cromwell leaves his
lord.

The king shall have my service; but my
prayers

For ever and for ever, shall be yours.

Wolsey: Cromwell, I did not think to
shed a tear

In all my miseries; but thou hast forced me,
Out of thy honest truth, to play the
woman.

Let's dry our eyes: and thus far hear me,
Cromwell;

And when I am forgotten, as I shall be;
And sleep in dull cold marble, where no
mention

Of me more must be heard of, say I taught
thee,

Say Wolsey, that once trod the ways of
glory,

And sounded all the depths and shoals of
honour,

Found thee a way, out of his wrack, to rise
in:

A sure and safe one, though thy master
missed it.

Mark but my fall, and that that ruined me.
Cromwell, I charge thee, fling away am-
bition:

By that sin fell the angels; how can man
then,

The image of his Maker, hope to win by't?
Love thyself last: cherish those hearts that
hate thee;

Corruption wins not more than honesty.
Still in thy right hand carry gentle peace,

To silence envious tongues. Be just, and
fear not.

Let all the ends thou aim'st at be thy
country's,

Thy God's, and truth's; then if thou
fall'st, O Cromwell,

Thou fall'st a blessed martyr. Serve the
king;

And, prythee, lead me in:
There take an inventory of all I have

To the last penny; 'tis the king's: my
robe

And my integrity to heaven is all
I dare now call mine own. O Cromwell,

Cromwell,

Had I but served my God with half the zeal
I served my king, He would not in mine age

Have left me naked to mine enemies.

Cromwell: Good sir, have patience.

Wolsey: So I have. Farewell

The hopes of court! My hopes in heaven
do dwell.

PASSAGES FROM SHAKESPEARE

LORENZO TO JESSICA

JESSICA : I am never merry, when I hear sweet music.

Lorenzo : The reason is, your spirits are attentive ;

For do but note a wild and wanton herd,
Or race of youthful and unhandled colts,
Fetiching mad bounds, bellowing, and
neighing loud,

Which is the hot condition of their blood ;
If they but hear perchance a trumpet
sound,

Or any air of music touch their ears,
You shall perceive them make a mutual
stand,

Their savage eyes turned to a modest gaze
By the sweet power of music. Therefore,
the poet

Did feign that Orpheus drew trees, stones,
and floods ;

Since nought so stockish, hard, and full
of rage,

But music for the time doth change his
nature.

The man that hath no music in himself,
Nor is not moved with concord of sweet
sounds,

Is fit for treasons, stratagems, and spoils ;
The motions of his spirit are dull as night,
And his affections dark as Erebus :

Let no such man be trusted.

The Merchant of Venice

THE TONGUES OF DYING MEN

O BUT they say the tongues of dying
men

Enforce attention like deep harmony :

Where words are scarce, they are seldom
spent in vain ;

For they breathe truth that breathe their
words in pain.

He that no more must say is listened more
Than they, whom youth and ease have
taught to glose ;

More are men's ends marked than their
lives before :

The setting sun, and music at the close,
As the last taste of sweets, is sweetest last ;
Writ in remembrance more than things

long past. John o' Gaunt in Richard II

TO BE OR NOT TO BE

TO be, or not to be, that is the question :
Whether 'tis nobler in the mind to
suffer

The slings and arrows of outrageous
fortune,

Or to take arms against a sea of troubles,
And, by opposing, end them ? To die ;
to sleep ;

No more ; and, by a sleep, to say we end
The heartache and the thousand natural
shocks

That flesh is heir to, 'tis a consummation
Devoutly to be wished. To die, to sleep :
To sleep ! perchance to dream ; ay, there's
the rub ;

For in that sleep of death what dreams
may come,

When we have shuffled off this mortal coil,
Must give us pause. There's the respect
That makes calamity of so long life :

For who would bear the whips and scorns
of time,

The oppressor's wrong, the proud man's
contumely,

The pangs of disprized love, the law's delay,
The insolence of office, and the spurns

That patient merit of the unworthy takes,
When he himself might his quietus make

With a bare bodkin ? Who would fardels
bear,

To grunt and sweat under a weary life,
But that the dread of something after

death,
The undiscovered country, from whose
bourn

No traveller returns, puzzles the will,
And makes us rather bear those ills we have

Than fly to others that we know not of ?
Thus conscience does make cowards of us

all ;
And thus the native hue of resolution

Is sicklied o'er with the pale cast of
thought ;

And enterprises of great pith and moment
With this regard their currents turn awry,

And lose the name of action. Hamlet

THE DEATH OF KINGS

Of comfort no man speak :

Let's talk of graves, of worms, and epitaphs ;
Make dust our paper, and with rainy eyes

Write sorrow on the bosom of the earth ;
Let's choose executors and talk of wills ;

And yet not so—for what can we bequeath
Save our deposed bodies to the ground ?

Our lands, our lives, and all are Boling-
broke's,

And nothing can we call our own but
death,

And that small model of the barren earth
Which serves as paste and cover to our

bones.
For God's sake, let us sit upon the ground

And tell sad stories of the death of kings :
How some have been deposed, some slain

in war,
Some haunted by the ghosts they have

deposed,

Some poisoned by their wives, some sleeping killed;
 All murdered; for within the hollow crown
 That rounds the mortal temples of a king
 Keeps Death his court, and there the
 antic sits,
 Scoffing his state and grinning at his pomp;
 Allowing him a breath, a little scene,
 To monarchize, be feared, and kill with
 looks,
 Infusing him with self and vain conceit
 As if this flesh which walls about our life
 Were brass impregnable; and humoured
 thus
 Comes at the last, and with a little pin
 Bores through his castle wall, and farewell
 king!
 Cover your heads; and mock not flesh and
 blood
 With solemn reverence: throw away
 respect,
 Tradition, form, and ceremonious duty,
 For you have but mistook me all this
 while;
 I live with bread like you, feel want,
 Taste grief, need friends; subjected thus,
 How can you say to me I am a king?

Richard II

THE SPEECH BEFORE HARFLEUR

ONCE more unto the breach, dear
 friends, once more;
 Or close the wall up with our English dead!
 In peace there's nothing so becomes a man,
 As modest stillness and humility:
 But when the blast of war blows in our
 ears,
 Then imitate the action of the tiger;
 Stiffen the sinews, summon up the blood,
 Disguise fair nature with hard-favoured
 rage,
 Then lend the eye a terrible aspect;
 Let it pry through the portage of the head,
 Like the brass cannon: let the brow o'er-
 whelm it,
 As fearfully as doth a galled rock
 O'erhang and jutty his confounded base
 Swilled with the wild and wasteful ocean.
 Now set the teeth, and stretch the nostril
 wide;
 Hold hard the breath, and bend up every
 spirit
 To his full height!—On, on, you noblest
 English!
 Whose blood is fet from fathers of war-
 proof;
 Fathers that, like so many Alexanders,
 Have in these parts from morn till even
 fought,

And sheathed their swords for lack of
 argument.
 Dishonour not your mothers: now attest
 That those whom you called fathers did
 beget you!
 Be copy now to men of grosser blood,
 And teach them how to war!—And you,
 good yeomen,
 Whose limbs were made in England, show
 us here
 The mettle of your pasture; let us swear
 That you are worth your breeding, which
 I doubt not;
 For there is none of you so mean and base
 That hath not noble lustre in your eyes.
 I see you stand like greyhounds in the
 slips,
 Straining upon the start. The game's
 afoot;
 Follow your spirit: and, upon this charge,
 Cry—God for Harry! England and Saint
 George! King Henry in Henry V

QUEEN MAB

O! THEN, I see Queen Mab hath been
 with you.
 She is the fairies' midwife; and she comes
 In shape no bigger than an agate-stone
 On the fore-finger of an alderman,
 Drawn with a team of little atomies
 Athwart men's noses as they lie asleep:
 Her waggon-spokes made of long spinners'
 legs;
 The cover, of the wings of grasshoppers;
 The traces, of the smallest spider's web;
 The collars, of the moonshine's watery
 beams:
 Her whip, of cricket's bone; the lash, of
 film:
 Her waggoner, a small grey-coated gnat,
 Not half so big as a round little worm
 Pricked from the lazy finger of a maid:
 Her chariot is an empty hazel-nut,
 Made by the joiner squirrel, or old grub,
 Time out of mind the fairies' coach-
 makers.
 And in this state she gallops night by night
 Through lovers' brains, and then they
 dream of love:
 O'er courtiers' knees, that dream on
 curt'sies straight;
 O'er lawyers' fingers, who straight dream on
 fees:
 O'er ladies' lips, who straight on kisses
 dream;
 Which oft the angry Mab with blisters
 plagues,
 Because their breaths with sweetmeats
 tainted are.
 Sometimes she gallops o'er a courtier's nose

PASSAGES FROM SHAKESPEARE

And then dreams he of smelling out a suit :
 And sometimes comes she with a tithe-pig's
 tail,
 Tickling a parson's nose as a' lies asleep,
 Then dreams he of another benefice :
 Sometimes she driveth o'er a soldier's
 neck,
 And then dreams he of cutting foreign
 throats,
 Of breaches, ambuscadoes, Spanish blades,
 Of healths five fathom deep ; and then
 anon
 Drums in his ear ; at which he starts and
 wakes ;
 And, being thus frightened, swears a prayer
 or two,
 And sleeps again. Romeo and Juliet

UNEASY LIES THE HEAD THAT WEARS A CROWN

How many thousand of my poorest
 subjects
 Are at this hour asleep !—O sleep ! O
 gentle sleep !
 Nature's soft nurse, how have I frightened
 thee,
 That thou no more wilt weigh my eyelids
 down,
 And steep my senses in forgetfulness ?
 Why rather, sleep, liest thou in smoky
 cribs,
 Upon uneasy pallets stretching thee,
 And hushed with buzzing night-flies to
 thy slumber,
 Than in the perfumed chambers of the
 great,
 Under the canopies of costly state,
 And lulled with sound of sweetest melody ?
 O thou dull god ! why liest thou with the
 vile,
 In loathsome beds ; and leav'st the kingly
 couch
 A watch-case, or a common 'larum bell ?
 Wilt thou upon the high and giddy mast
 Seal up the ship-boy's eyes, and rock his
 brains
 In cradle of the rude imperious surge :
 And in the visitation of the winds,
 Who take the ruffian billows by the top,
 Curling their monstrous heads, and hanging
 them
 With deafening clamours in the slippery
 clouds,
 That, with the hurly, death itself awakes ?
 Canst thou, O partial sleep ! give thy
 repose
 To the wet sea-boy in an hour so rude ;
 And in the calmest and most stillest
 night,

With all appliances and means to boot,
 Deny it to a king ? Then, happy low, lie
 down !
 Uneasy lies the head that wears a crown.
 King Henry in Henry IV

A MADRIGAL

CRABBÈD Age and Youth
 Cannot live together ;
 Youth is full of pleasance,
 Age is full of care ;
 Youth like summer morn,
 Age like winter weather ;
 Youth like summer brave,
 Age like winter bare.
 Youth is full of sport,
 Age's breath is short ;
 Youth is nimble, Age is lame ;
 Youth is hot and bold,
 Age is weak and cold ;
 Youth is wild and Age is tame.
 Age, I do abhor thee ;
 Youth, I do adore thee ;
 O, my Love, my Love is young !
 Age, I do defy thee ;
 O, sweet shepherd, hie thee !
 For methinks thou stay'st too long.
 The Passionate Pilgrim

FRIENDS AND FLATTERERS

EVERY one that flatters thee
 Is no friend in misery.
 Words are easy, like the wind ;
 Faithful friends are hard to find.
 Every man will be thy friend
 Whilst thou hast wherewith to spend ;
 But if store of crowns be scant
 No man will supply thy want.
 If that one be prodigal,
 Bountiful they will him call ;
 And with such-like flattering,
 " Pity but he were a king."
 But if Fortune once do frown,
 Then farewell his great renown ;
 They that fawned on him before
 Use his company no more.
 He that is thy friend indeed,
 He will help thee in thy need ;
 If thou sorrow, he will weep ;
 If thou wake, he cannot sleep :
 Thus of every grief in heart
 He with thee doth bear a part.
 These are certain signs to know
 Faithful friend from flattering foe.

The Passionate Pilgrim

WISE SAYINGS FROM SHAKESPEARE

How far that little candle throws his
beams!
So shines a good deed in a naughty world.
Merchant of Venice

AND oftentimes, excusing of a fault
Doth make the fault the worse by
the excuse.
King John

O! it is excellent
To have a giant's strength; but it is
tyrannous
To use it like a giant. Measure for Measure

But 'tis a common proof
That lowliness is young ambition's ladder,
Whereto the climber-upward turns his
face:
But when he once attains the upmost
round,
He then unto the ladder turns his back,
Looks in the clouds, scorning the base
degrees
By which he did ascend. Julius Caesar

A FRIEND should bear his friend's in-
firmities.
Julius Caesar

THERE is a tide in the affairs of men,
Which, taken at the flood, leads on
to fortune;
Omitted, all the voyage of their life
Is bound in shallows, and in miseries.
On such a full sea are we now afloat;
And we must take the current when it
serves,
Or lose our ventures. Julius Caesar

How oft the sight of means to do ill deeds,
Makes ill deeds done! King John

I DARE do all that may become a man;
Who dares do more, is none. Macbeth

To be a queen in bondage is more vile
Than is a slave in base servility;
For princes should be free. Henry VI

LIFE every man holds dear; but the
brave man
Holds honour far more precious dear than
life. Troilus and Cressida

To gild refined gold, to paint the lily,
To throw a perfume on the violet,
To smooth the ice, or add another hue
Unto the rainbow, or with taper-light
To seek the beauteous eye of heaven to
garnish,
Is wasteful, and ridiculous excess.
King John

IF all the year were playing holidays,
To sport would be as tedious as to
work;
But when they seldom come they wished
for come,
And nothing pleaseth but rare accidents.
Henry IV

WHAT stronger breast-plate than a heart
untainted?
Thrice is he armed, that hath his quarrel
just;
And he but naked, though locked up in
steel,
Whose conscience with injustice is cor-
rupted. Henry VI

AT Christmas I no more desire a rose,
Than wish a snow in May's new-
fangled mirth;
But like of each thing that in season grows
Love's Labour's Lost

Our doubts are traitors,
And make us lose the good we oft might
win,
By fearing to attempt. Measure for Measure

THE sense of death is most in apprehension;
And the poor beetle that we tread upon
In corporal sufferance finds a pang as great
As when a giant dies. Measure for Measure

GOOD name in man and woman, dear
my lord,
Is the immediate jewel of their souls:
Who steals my purse steals trash; 'tis
something, nothing;
'Twas mine, 'tis his, and has been slave to
thousands;
But he that filches from me my good name
Robs me of that which not enriches him,
And makes me poor indeed. Othello

BETWEEN the acting of a dreadful thing
And the first motion, all the interim is
Like a phantasma, or a hideous dream:
The genius, and the mortal instruments,
Are then in council; and the state of man,
Like to a little kingdom, suffers then
The nature of an insurrection.
Brutus in Julius Caesar

I COUNT myself in nothing else so happy
As in a soul remembering my good
friends;
And, as my fortune ripens with thy love,
It shall be still thy true love's recompense.
Bolingbroke in Richard II

The Story of the Most Beautiful Book in the World



Paul, Greek scholar and a Roman citizen, preaching to the Greeks

HOW CHRISTIANITY SPREAD

WHEN people speak sorrowfully of the disputes among Christians today, and talk of the early Church where all was simplicity and holy faith, they are but dreaming. Never has there been a peaceful, happy Church united in a simple faith.

There might have been this single and united Church, but the peace would have been the peace of death. It was the great hand of Paul, the tireless and zealous champion of a world religion, that sowed discord and reaped life.

At the outset of any study of Christian history is the great struggle between the Jew follower of Christ and the Gentile follower. We must understand this clearly to realise not only the history of the Church, but, what is infinitely more important, the Spirit of Christ working among all peoples. Let us see distinctly the first great disunion of Christendom, which was the first step forward on the road of Christianising the world.

When Paul perceived how readily the foreigners at Antioch received the idea of Christ's character and his revelation of God's love for men, he became eager to spread a knowledge of Christ among all nations. How wonderful for the history of the world was Paul's first setting out to spread the truth of Christ among all people! Like Ulysses, who traversed the seas and penetrated distant lands, the Spirit of Christ was to move upon the face

of the waters and shine into the dark places of the earth. No journey ever made by man can be compared with this movement of the Spirit of Christ across the globe.

Paul and Barnabas, two poor Jews, set out one day from Antioch for the port of Seleucia, thence to take ship and preach Christ among all nations.

History (says Dean Farrar) has contemptuously obliterated from her annals the names of countless kings who have set forth from their capitals for the scourge or conquest of nations at the head of armies, and with all the pomp and circumstance of glorious war; but she will preserve in the grateful memory of mankind the names of these two poor Jews, who started on foot, staff in hand, with little or nothing in their scrip but the few dates that suffice to satisfy the hunger of the Eastern traveller.

Paul was weak in body, nervous in mind, and a poor speaker; yet he went forward to endure such bitter sufferings as would have broken down a giant:

the scourgings, the flagellations, the stoning, the shipwrecks, the incessant toilings on foot along intolerable and dangerous roads; the dangers from swollen rivers and rushing water-courses, the dangers from mountain brigands, the dangers from Jews, from Gentiles, from false Christians in city and wilderness and sea; the frantic crowds that nearly tore him to pieces; the weary nights; the chill, naked, thirsty, famine-stricken days; the incessant wearing responsibility; the chronic disease and weakness; all the outrages, all the insults, all the agitating

GREAT FIGURES OF THE OLD TESTAMENT · THE LIFE OF JESUS

bursts of indignation against those who put stumbling-blocks in the paths of the weak, the severe imprisonments, the incessant death; and all ended by desertion, failure, loneliness, chains, condemnation, the chilly dungeon, the nameless martyrdom.

PAUL'S TESTIMONY TO THE LOVE OF GOD AND THE HUMANITY OF JESUS

We stand amazed at what this man endured; and the more we consider his work the more do we feel that he is history's greatest witness to the undeniable truth of Christ.

What was the end of his first labours as a missionary? Certain Jew Christians were sent out from Jerusalem to spy upon his work. They came to find fault with him, to denounce him, to betray him.

Yet surely here was a man doing more than them all for the cause they had so deeply at heart. Why molest him, why inconvenience and check him? The answer is that Paul was molested because he widened the humanity of Christ and the mercy of God.

The Jewish Christians wanted to convert the nations not to Christ but to the Jewish religion and the Jewish idea of Christ. If a foreigner came to them and said: "I have heard about Jesus; I think that what he said is true; I admire his beautiful life; I should like to follow his example and serve him among other men," they made answer: "You must submit yourself first of all to the Law of Moses; you must become a Jew that you may become a Christian."

But Paul had one burning ambition, and one alone—to make men Christians. He was not a patriot; no narrowness of geography or history cramped his large and ample spirit. He saw all the Earth as God's, all the nations as children of one universal Father, and Christ as the Light of the World. So he did not say that people must become Jews in order to become Christians, but that they must become Christlike in order to realise God's fatherhood. He said the Law of Moses was swept away by the sacrifice of Christ.

HOW PAUL SAVED CHRISTIANITY FROM THE HARD YOKE OF JEWISH CUSTOM

A great controversy arose. Paul had to go to Jerusalem to defend himself. At that little humble meeting of men there were Peter, reckoned head of the Church, and James, the brother of Jesus, who occupied a position of extreme

dignity and power—a Jew of Jews, but holy, ascetic, and just. It was a meeting destined to affect the history of the world.

We need not enter into the subject of this great discussion, concerned with Jewish customs that are now difficult to understand, and having reference largely to the case of a Greek named Titus, with whom certain Hebrew Christians refused to eat because he ignored these customs.

The quiet confidence of Paul and Barnabas convinced the honest-minded; and both Peter and James spoke on their side. The conference decided that a Greek or a Roman need not submit to the Jewish customs in order to become a Christian, but agreed that he must follow one or two well-defined rules as to eating and drinking.

Paul won in part, but not wholly, and yet the entire victory was already won. The character of Christ had passed beyond the narrow streets of Jerusalem and escaped from the petty disputations of Jewish doctors, when the first foreigner felt the spell of that exquisite life, and spoke about it with others of his nation. It was only within the narrow circle of the Church that Paul's victory was incomplete. His sorrowing spirit was dragged downward by this miserable quarrel, and for years afterwards he could never refer to it without pain and indignation.

HOW THE WORK OF PAUL TURNED THE TIDE OF THE WORLD'S THOUGHT

He could not realise that whether Peter and the brother of Jesus decided in favour of Jewish customs or not was a matter of no consequence. But every man is in some measure a slave of the period in which he lives, and Paul attached more importance to the apostles than was really justified. It could not, perhaps, be otherwise. There was no printed Bible to assure him that he was in truth following the ideas of Christ, as well as the inspiration of his own large and luminous nature. He was almost obliged to refer himself to Peter and the other narrower apostles in petty matters of racial dispute.

But he went forward to do his great and unequalled work, to be known in history, as Dr. Martineau says, as "the travelled ambassador of Christ, who snatched Christianity from the hands of a local faction, and turned it to a universal faith, whose powerful work shook all the gods from Cyprus to Gibraltar; who turned the tide of history and thought, giving us

HOW CHRISTIANITY SPREAD

the organisation of Christendom for the legions of Rome."

We learn, then, from this incident that the early Church, which would have made Christianity only a development of the Jewish Law, was made a world-religion by the splendid genius and the high courage of Paul. He was concerned not with ideas and definitions concerning Christ, but with the Spirit, the Character, of Jesus of Nazareth, Son of God, and Light of the World.

THE GREAT MISSIONARY RETURNS TO JERUSALEM AND THE TEMPLE

After years of missionary labour, unequalled in the history of the world, Paul returned to Jerusalem. He brought with him money for the poor Jews of the Christian faith and tidings that the influence of Christ was spreading among the foreign nations. He was received coldly.

Those who appreciated his magnificent nature, and the power of his intellect, advised him in secret to go to the temple and perform certain purely Jewish rites in order that suspicions about his patriotism might be allayed. It was said, they told him, that he had declared abroad God's equal favour for Jew and Gentile, and had made light of the Jews' claim to be a peculiar people. It would be wise if he went to the Jewish temple and made clear his respect for the tradition of Moses.

Paul had never despised the Jews; never made light of the immense work done for righteousness by Moses and the prophets. All he had said was to declare that Christ's work exceeded all the other work done for God, and that every race represented the sonship of humanity.

PAUL GOES UP TO THE TEMPLE AT THE PASSOVER

But he was willing to offend no man, and if he was a Gentile to the Gentiles, so could he be a Jew to the Jews, provided always that his faith in Christ was known to be the supreme passion of his life. Therefore he went up to the temple. It was the season of Passover, and thousands of Jews from all parts of the world had flocked to the holy city for this sacred feast. The city was full of Jews from all nations, dark-skinned and pale, wearing every kind of dress, speaking every kind of language, but united in the common superstition of their religion.

One day a number of Asiatic Jews, thronging through the temple, caught

sight of a small, thin, emaciated old man, bowed by labours and bronzed by sun and wind, standing there with four others and looking about him with an eye that had the flash and penetration of an eagle's. These pilgrims stopped, pointed him out, whispered among themselves, and, with cries of rage and gestures of hate, sprang upon this man with the cry of "Men of Israel, help!" They had recognised Paul.

In a moment the temple was in a tumult. The worshippers and pilgrims came running from every court and quarter of the building. One name was on every lip—the name of Paul, Paul the false Jew, the apostate, the renegade, the ex-Pharisee; Paul who had made light of the Jews among foreign nations, who had been flogged again and again but still degraded the Jewish religion, and set the Gentile equal with the people of Jehovah. Fierce cries were heard on every side, faces distorted with passion flashed through the temple, the pavement echoed with the patter of feet, the air was filled with the rustle of garments, and round about Paul himself were shrieks, yells, and curses, the spirit of murder.

THE FIERCE TUMULT IN THE TEMPLE AND THE RESCUE OF PAUL

Before they could destroy him, Lysias, the Roman commandant, arrived upon the scene with centurions and soldiers. Paul was rescued, put into chains, and led away. The crowd followed, shrieking for his death. He was saved from being torn to pieces, says Dean Farrar, chiefly by the fact that Lysias kept close by him; and, as the rescue-party was about to disappear into the barracks, Paul spoke to him in Greek. "I am a man which am a Jew of Tarsus, a city in Cilicia, a citizen of no mean city," said he, "and I beseech thee suffer me to speak unto the people."

It was an undaunted request to come from one whose life had just been rescued from that raging mob, and who was suffering from their rough treatment. Snatched from his persecutors after imminent risk, barely delivered from that most terrifying of all forms of danger, the murderous fury of masses of his fellow-men, he asks leave to address the densely-thronging thousands, who were kept from him only by a little belt of Roman swords.

The splendid speech of Paul, narrating the story of his conversion in a few graphic phrases, was listened to with wonder and increasing admiration; then he spoke of

the message he had received: "Depart, for I will send thee far hence *unto the Gentiles*."

At that point, stung by the hated word Gentiles to remember all the bigotry and intolerance of their natures which his eloquence had lulled to rest, the mob swayed towards Paul with a scream of rage, crying out: "Away with such a fellow from the Earth, for it is not fit that he should live."

Paul was tried by the Roman judge Felix. It was quite clear he had done nothing to deserve death, nothing even to deserve arrest; but Felix did not care to offend the chief priests of the Jews by setting Paul free. He let time pass, and amused himself by having this much-talked-about Jew brought privately before himself and his wife.

PAUL APPEARS BEFORE KING AGRIPPA AND HIS COURT

Felix was old, cruel, and wicked; his wife Drusilla was a young and very beautiful Jewess. When Paul was invited to talk before them, he spoke of Christ and the life of purity and love. He made them feel conscious of their evil and idle lives by speaking of the perfect life of Jesus.

Paul was kept in prison till Festus came to Judaea to occupy the position of Felix. Paul now appealed, as a citizen of Rome, to Caesar, which meant that he would be tried in Italy. Before he was deported, however, the last of the Herods, Agrippa II., came to Caesarea on a State visit to Festus. One day Festus spoke of Paul, the Jew-Christian who had appealed to Caesar, and Agrippa said he would like to see this interesting man. Festus, to amuse his kingly guest, had Paul brought before him. It was not a legal trial; it was not a private interview; it was a show, an entertainment. The chief officers of the army and the important people of the neighbourhood were invited to meet King Agrippa and his sister Bernice.

THE TREMENDOUS EFFECT OF PAUL'S WORDS ON KING AGRIPPA

When they were seated, and all the polite ceremonies and tedious formalities had been completed, Festus laid the story of Paul's arrest before the king; and the king, turning to the prisoner, said: "Thou art permitted to speak for thyself."

Agrippa, unlike many of the kings and procurators set over the turbulent Israelites by the Roman Caesar, really knew the people, their scriptures, their habits, and their ideals. Therefore, with great confi-

dence Paul unfolded the story of his early life to King Agrippa—his enthusiasm for the Pharisees, his devotion to the God of Israel, his hatred of the Nazarenes.

From this he passed to the vision on the road to Damascus, the arresting words, *Saul, Saul, why persecutest thou Me?* and the command that he should be a witness to the Gentiles.

Whereupon, O King Agrippa, (he continued) I was not disobedient unto the heavenly vision.

Having, therefore, obtained help of God, I continue unto this day witnessing both to small and great, saying none other things than those which the prophets and Moses did say should come: that Christ should suffer, and that He should be the first that should rise from the dead, and should show light unto the people and to the Gentiles.

After an interruption from the Roman governor, Paul turned to King Agrippa and cried: "Believest thou the prophets? I know that thou believest!" And Agrippa answered: "Almost thou persuadest me to be a Christian!"

HOW THE GREAT LONGING OF PAUL'S HEART WAS FULFILLED

At this jest the gathering must have smiled and rustled their fine clothes. King Agrippa a Christian! How amusing! But Paul broke through the titters with these fine and measured words: "I would to God that not only thou, but also all that hear me this day, were both almost and altogether such as I am, except these bonds."

The king rose. The company began to chatter and make their farewells. Paul went back to his prison. As Agrippa walked beside Festus he said: "This man might have been set at liberty if he had not appealed unto Caesar." Destiny decided that Paul's great wish should be fulfilled, that he should preach Christ in the very heart and centre of the Roman Empire, in the mighty capital of the whole world. But it was to be as a prisoner. The conqueror was to be in chains.

Does it not convince us of the extraordinary genius of Paul that, while most of the influential Christians were congregating in Jerusalem, and regarding that sacred city as the axle of the new religion, Paul should have looked far away to the capital of the Roman Empire and perceived that *there* was the centre from which the Light of the World should radiate to all points?

The Interests and Pleasures of Life for All Indoors and Out



HOW TO BECOME A VENTRILOQUIST

VENTRILOQUISM is not, as many suppose, an art possible only to a few with special gifts; it can be practised by most people who will follow certain well-defined rules, and persevere till usage brings perfection.

No particular structure of the vocal organs is necessary. A muffled vibration in the cavity of the mouth caused by the action of the tongue and lips produces a kind of whispering in which the words seem to come from a distance, and the illusion is helped by means of a doll with a movable head and jaws, to which the attention of the audience is directed away from the face of the ventriloquist.

A well-known performer thus describes his mode of speaking when he wishes to produce the illusion of a voice proceeding from a doll: "I press my tongue against my teeth, and thus circumscribe a cavity between my left cheek and teeth, in which the voice is produced by the air held in reserve in the pharynx. The sounds thus receive a hollow and muffled tone which causes them to appear to come from a distance."

It is essential to have the breath well under control, and not to respire more than can be avoided. Practice, which should always be carried out in front of a mirror, so that the control of the jaws and mouth may be watched, will produce elasticity in the vocal organs. The voice should never be strained; that is a mistake which many would-be ventriloquists make. The powers must be developed quite naturally or hoarseness will result.

But quite as important as controlling the movements of the mouth is the necessity of misleading the judgment of the listeners. We judge the distance from which a sound comes by experience—that is, by comparing it with other sounds whose distance we know. A ventriloquist will, therefore, mislead the imagination of his hearers by reducing or increasing the loudness of the tones while preserving the same pitch, quality, and duration.

Near sounds are generally louder than distant ones, and the skilled ventriloquist will produce a kind of perspective of sounds which will deceive his hearers into thinking they come from different points. He will indicate directly or indirectly the direction from which he wishes his audience to believe the sound is coming, and here we see the value of learning to manipulate one or two dolls with movable heads and mouths. This needs very great practice, but the audience will instinctively watch the mouth of the doll moving, when it is supposed to be speaking, in exactly the same way as they instinctively watch the lips of a lecturer.

By a gesture the ventriloquist will indicate to the audience the direction from which he wishes them to believe a sound is coming; and this he can do in a variety of ways, as, for example, when he looks or listens in that direction. The audience will unconsciously do the same, and thus, before a sound has been uttered, the listeners are prepared to expect the sounds from that place. All the ventriloquist then has to do is to adjust the loudness of his voice to the distance.

CRAFTS · GAMES · NEEDLEWORK · PUZZLES · SCIENCE EXPERIMENTS

It is important for the operator to remember that he must make the sounds not as they should appear at their source, but as they would be heard if travelling from such a distance. The change of pitch and tone, too, adds to the illusion. If the ventriloquist is using a doll which represents a boy or girl he will give his voice, when supposed to be coming from the doll, a high pitch like a boy's or a girl's. On the

other hand, if the doll represents an old man the operator will make the feigned voice deep and gruff.

Very great practice is necessary to carry on a conversation between two or three persons, as, for example, between the ventriloquist and two dolls, and to adjust the voice quickly and readily without hesitation. In no branch of entertainment is it more true that practice makes perfect.

HOW TO PLAY DRAUGHTS

THE ordinary game of draughts, unlike most amusements, is so simple that a child can learn to play it, and yet it lends itself to such careful study that men play it almost as they play chess, looking many moves ahead, and making the most wonderful combinations.

The board has 64 squares, 32 of one colour, as, for example, white; and 32 of another colour, such as black. There are 24 men (discs of wood or bone), 12 white and 12 black. Each player takes one of the sets of men and arranges them as in the first picture, taking care that there is a white square at the bottom right-hand corner of the board.

The pieces are placed on the black squares to start with, and are always played on these squares, never being moved on to the white. They are moved diagonally, that is, the man A in the picture will move to B or C, but will not leap across the white square E to D.

They move forward, one square at a time, the players moving alternately. A man is captured by the opponent's piece leaping over him diagonally into a vacant square beyond, and the captured man is removed.

If, after leaping across an opponent's man into the next square beyond, we come next to another of our opponent's pieces with a vacant square beyond that, in either direction, we can continue our move and leap over this second piece, taking that as well as the first one. Even more men can be captured at a single move, provided each one has behind him a vacant square into which our piece can be moved.

The second picture, which is a game in course of being played, will explain the

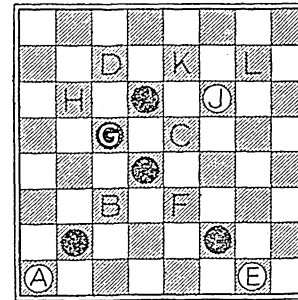
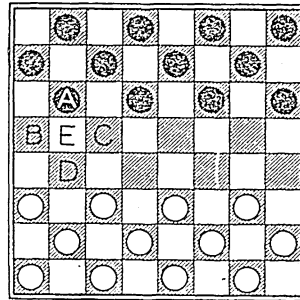
moves clearly. We can move from A to B, then to C and then to D at one move, taking three of the black pieces on the way. But from E we could move only to F; we could not go to G because it is occupied by a black piece, and we could not leap across two pieces together and go to H. When we are not capturing the men we move only to the next square. The white man J, for instance, in picture 2, can move only to K or L.

As soon as a man has reached one of the four squares at the opposite end of the board he is crowned—that is, has another draught put on top of him, and becomes a king. He can now move either backward or forward; sometimes five or six men may be captured

by a king at one move. The object of the game is to take all our opponent's men, or so block them up that they cannot move; then we have won. When an opponent is able to take one of our men, and does not do so, we

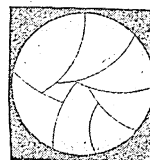
can either huff him—that is, take from the board the man with which he could have captured our piece—or we can compel him to make this move in preference to the one he has taken. Huffing does not count as a move.

The choice of colour is decided by lot, and black moves first. In each fresh game we change our men, playing first with black and then with white, and so on. If we touch a man we must move that man. If we remove one of our own men from the board by mistake we have to lose it. Usually when only two kings remain on the board a deadlock occurs, and there is no way of either player winning except by the gross carelessness of the other; therefore, with only two kings on the board the game is drawn.



THE ANSWERS TO THE PUZZLES ON PAGES 6420 & 6423

ON page 6420 is a series of puzzle picture-names of famous people who will be found in the Index of the Children's Encyclopedia. Here is a list of their names: 1. Tarquin, 2. Drake, 3. Selkirk, 4. Baker, 5. Agrippina, 6. Emmanuel, 7. Dampier, 8. Blaxland,



9. Columbus, 10. Romulus, 11. Antony, 12. Shakespeare.

On page 6423 is the puzzle of the cut silk. A mischievous boy cuts up his mother's tablecloth; the picture shows how the pieces were fitted together again.

WHAT TO DO IN CASE OF FIRE

FIRE is all right in its proper place, but altogether to be dreaded where it can burn people or destroy property.

Little children are sometimes burned to death because they make a plaything of fire. Suppose we have a little brother, and one day when we are alone with him his clothes or hair catch fire, what must we do?

In the first place, we must stop the child from rushing about the room or out into the passages and open air, for that would make the clothes burn all the faster. We must seize a rug, a shawl, a coat, a blanket, a tablecloth, or any big piece of woollen material, and wrap it tightly round him. That will stifle the flames, and they will go out for want of air. If a rug is near, we should roll the child on the floor in it, covering our hands as much as possible, or they will be burned too. If we cannot get a rug quickly, we should roll the child over and over on the floor. We must either press out or smother the flames, and, if the window is open, get it shut as soon as possible.

Lamps upset sometimes, or the paper shade falls on one side and catches fire. The burning oil flares up, and there is not a moment to lose. If possible, the hands should be wrapped in a handkerchief, cloth, or leather, and we must then bravely take the lamp at arm's length and hurl it out of the window or into the grate, and sop up the oil. There is, perhaps, a tablecloth on the table where the lamp stands; the corners of it should be taken up, and the burning oil smothered with them. To pour water on the oil makes it blaze more fiercely, but flour, sand, or earth will put out fire.

It sometimes happens that the window of a bedroom is left open, and lace curtains are blown over a lighted gas-jet. In a moment the curtains are alight. Here is our best course of action now. We must first get on a chair and try to tear the burning curtains down, or, if we can do so, lift off the rods or poles. Then empty all the water at hand over them, or smother them with bed-clothes. As soon as possible we should shut the window and door to prevent a through current of air in the room. A syphon of soda-water squirted at once is a good thing to extinguish a small blaze.

Chimneys catch fire, usually because they are blocked up with soot, or the fire sets light to a beam of wood near. We must first put out the fire in the grate by pouring water or throwing flour, salt, sand, or earth over it, and then hold a board, wet blanket, tablecloth, or piece of carpet before the fire-place to keep the fumes out of the room, and to shut off a current of air from below. If the fire is very bad, and likely to set the house alight, the fire-engine must be fetched, and the firemen will probably get on the roof and block the top of the chimney to keep all air out.

Now we come to talk of a very dangerous state of things—a house on fire at night when people are in bed and asleep. Sensible folk talk over this, and think what they would do if it ever happened. In a high building they usually have a long coil of rope or a rope-ladder ready to fix on to the balcony, leg of a bedstead, or a large piece of furniture, so that escape is possible by the window. Failing these precautions, sheets and blankets can be knotted together into reef knots at the corners, as described on page 4464, and used as a rope to climb down, the mattress being first thrown out of the window to soften a possible fall.

Sometimes people wake in time to notice a smell of burning, and, of course, get up and find out the cause; but often the first they know of a fire at night is being choked by smoke. They wake up in alarm, but before jumping wildly out of bed and running downstairs, they should stop to think a moment and find out the place of the fire and its state. We will suppose the fire is very fierce when we open the bedroom door. If other people are in the house, we must, of course, call to them. We can do that while wrapping a blanket around us, thrusting our feet into shoes, and tying a wetted towel or handkerchief round our head and mouth. Suppose the passage is full of blinding smoke. We should not try to walk upright, but creep on our hands and knees the nearest way to safety—upstairs, if the staircase is alight below us; downstairs, if it is alight above us. The air is freest from smoke close to the floor. Houses are now built so that tall ones must have a skylight, an outside staircase, or some means of exit by which we can reach the roof.

If we are in a school or a public building which catches fire, there is not only danger of being burned, but risk of being crushed and trampled on when the crowd rushes wildly to get out through one or two doors. In schools fire-drill is usual, and the children march out, exactly as their teachers tell them to do. Everyone gets out in the shortest time possible, and there is no blocking of the passages; but when panic occurs in a hall or big public room, and people hustle and press towards the door, it is wise to look out for another way of escape, for there usually is one—a back or side door, a window to be reached by piling chairs or forms on one another.

We should then break the glass and shout. Someone outside will see us or hear our cries, and bring a ladder. If we are in the middle of the panic-stricken crowd, we are safest if we keep our head up, our arms doubled up in front of our chests, our elbows to our sides. That gives us the best chance to breathe and resist pressure on the ribs.

Above all, the great thing to remember is to keep calm, and not lose our heads.

WHAT ARE THESE PLANTS ?

HERE we have a plant puzzle game in which six plants are correctly described to us, and from these descriptions we should be able to name the plants. The right names are given in Section 54 of Group 18.

1. On the southern shore of England, where the tide washes over it every day, among rocks and shells there lived a little brown plant. It had a root and branches that were tough, quite unlike the hard, woody twigs of a tree. It would have liked to grow pretty flowers, but it could not manage that, so it gazed instead at the lovely sea-anemones that lived on a rock opposite. All its life it had dwelt in the same little crevice of a rock. In the hot summer days it used to get flabby and limp in the blaze of the sun, and it thirsted for the cool refreshing water to revive it. When the tide came up it pushed up its branches and waved them in sheer pleasure. A branch once floated on to the sand and lay there till a little boy came along. He picked it up, and "Pop, pop, pop!" it went as he pressed it between his thumb and fingers. What is the plant called?

2. There is a very strange plant growing in a meadow, so strange that one might think it a magic plant. It chooses a funny time to do all its growing, for it grows up in a night. It is a pale white thing, and we have to search quite underneath it near the stem to find any colour. There are rich brown plates under the white cap, all placed evenly side by side like the spokes of a wheel. What is it?

3. June is the month of flowers, and then all the fields and hedgerows and gardens are gay with them. Here is a flower growing by the path through a field; perhaps it would be more correct to say numbers of yellow flowers all on one long, slender, jointed stem. The little pistil in the middle of the flower is also long and divides into two. Two long-stalked stamens balance the powdery anthers with their pollen. The leaves are long, pointed, and narrow. "How sweet it smells!" says a little girl, as she comes to a haystack at the corner of the field; but she does not

think the plant has anything to do with the haystack. What is this plant's name?

4. Someone gave a brother and sister a slightly flattened, round, brown thing, dry and hard, which reminded them of an onion. The friend who gave it to them asked for a bowl, put some pieces of charcoal in the bottom, then some coconut fibre mixed up with broken shell, and buried the dry brown thing in it. "Keep it wet, and put it away in the dark," the children were told. So every day they had a look at the bowl, till at last a light green point began to show through the brown coat. Then they were sure it was a plant, and brought it out into the light and put it in the window for the sun to help it to grow green leaves. When it was still quite young it sent up a flower-stalk, and as the days went by the buds opened out into beautiful bell-like pink flowers. What is its name?

5. Millions and millions of just one kind of plant! It takes hours and hours to pass them in the train, and our eyes get dazzled with the golden colour. What a wonderful plant! Let us take home a seed, and put it in some damp sand. Six days later it will have grown a little hairy root downward, and two more are just appearing beside it. Upward into the air it will send a shoot, and about ten days later a leaf will have grown out of this. All the early summer it goes on getting taller. Then it puts forth flowers, though we should hardly know them for such. These produce seeds, and how precious these seeds are! Without them we should go hungry, for they are our daily food. What is the plant?

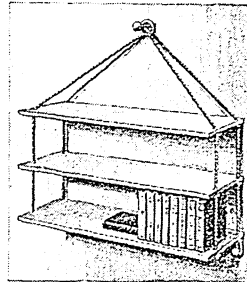
6. On one of the sunny isles of the South Sea is a very tall plant. Its pretty, feathery-looking leaves all grow at the top. Every year it has been growing nice things that are really seeds, sometimes two hundred of them, for the children in England, things they like to eat and drink, and make into sweets, cakes, and biscuits, and sometimes use for making soap and for oil for lamps. They are all wrapped round with brown coats that are made into matting, mats, and baskets. What is the plant's name?

A BOOKSHELF EASILY MADE

A SIMPLY made set of bookshelves that can be hung on a wall is shown in the picture, and the cost is almost nothing at all.

A wooden box may be bought at the grocer's for a few pence, and will supply all the wood we need. It can be smoothed by rubbing first with emery-paper, and then with fine sand-paper.

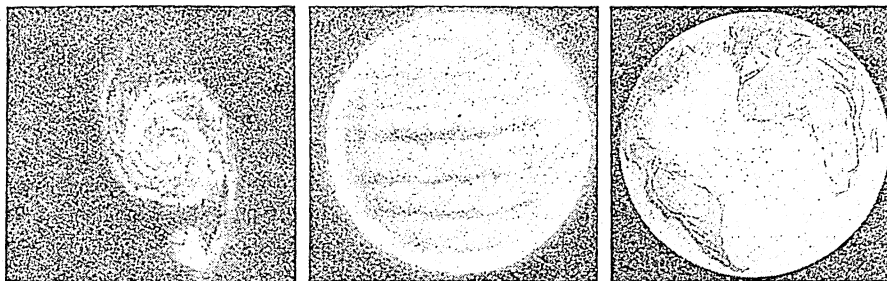
The shelves should be from half to three-quarters of an inch thick, eight inches wide, and two or two-and-a-half feet long. We make a hole at each corner, and if we have no brace and bit we can do this equally well by using the point of a red-hot poker.



All that is needed now to make the shelves serviceable is a quantity of thin but strong rope, which we pass through the holes, making a knot under each corner of each shelf to keep it in position. At the top the ropes are tied together; or we can fasten the ends to a ring, which will hang over a nail, and thus suspend the nest of shelves on the wall.

The shelves can be stained mahogany, walnut, or oak, according to taste, and they are then ready for use. They have the advantage of being easily portable, as when not needed the shelves will lie flat on one another, and the rope can be wound round them.

The Story of the Boundless Universe and All Its Wondrous Worlds



From such a nebula as that seen on the left came the Earth, breaking away and taking a shape of its own until in the course of millions of years it cooled down and became as we know it today.

THE WORLD THROUGHOUT THE AGES

WHAT does the future hold for the great ball we live on? Where is it going? Will the vast forces of matter that animate it, and the mind of man that masters them as it understands them, have an end?

To none of these questions is the answer complete; we can but hesitatingly reply that through all the past, as we have learned to know it, there has been a constructive purpose at work which has risen superior to all catastrophes, and that what is true of material things is in a still higher degree true of things of the mind. So that we may in all humility believe that no limit can be set to man's destiny or to the forces which surround him.

We have read through many pages the story of our Earth. We have considered its position among its neighbouring planets, and as subject to its ruler the Sun; and we have looked at the place the Sun occupies in the solitude of space. As the vastness of space, and the uncounted multitude of stars, which are like bright specks of dust within it, are examined, and the more carefully the distances which separate the stars are measured, the greater do they appear to grow.

But it is the mind of man which is measuring them. It expands with them; they grow greater as it grows, but they do not become immeasurable. In the years since the Great War began the size of the visible universe of stars has seemed to swell

as our knowledge of the distances of clusters of stars and starry nebulae has been increased, yet we receive assurance that the human intellect will never be out-distanced in the effort to comprehend.

These thoughts can also be applied to the path which the Earth, the child of the Sun, is following with its parent. If we glance back merely a few hundred years, there was a time when the Earth was supposed to be fixed in space, with the Sun and the stars beyond revolving about it; and even a few decades ago, when this superstition had been long exploded, the movement of the Sun through space was summed up by saying that it appeared to be moving at a rate of 13 miles a second towards a point in the constellation of Hercules. The stars towards which it was travelling were themselves moving, because no star can possibly stand still; but how they moved and what was the method in their movements were for long unknown.

But in the closing years of the nineteenth century the Dutch astronomer Kapteyn suggested that all the stars were moving in two great streams, each stream having its own average motion, to which all its stars conformed. This idea has illumined all the measurements of the stars since; and though we are far from knowing how star streams move, or how many of them there are, or whether many stars have not yet been swept into them, gradually their

ASTRONOMY · GEOLOGY · GEOGRAPHY · CHEMISTRY · PHYSICS · LIFE

movements are being sorted out, and we no longer have to think of the stars as like a swarm of bees or the molecules of a gas. Even the Sun, a very insignificant wanderer among the thousand millions of its companions, may presently be assigned a definite path and journey in the stream of the great biscuit-shaped Milky Way. Already it is known to be moving in the plane of this stream, and not very far, as astronomical distances go, from its centre. Thus, though the answer is not sure, and may even be proved wrong, we can say in a fashion where the Earth is going.

WHAT RADIUM TELLS US OF THE LIFE OF THE SUN

How will the Earth fare on its journey? That depends a good deal on the Sun. Even in the middle of the nineteenth century a rather depressing view was taken of the Sun; and though, as Sir Robert Ball used to say, there was no need for the people of the present to trouble themselves about the Sun's going out, the number of millions of years assigned to its life was not tremendous. But the powers of radium in giving out heat have revolutionised men's ideas of the length of life of the Sun. Instead of cooling and decaying, it may be growing hotter. When an atom of radium breaks up it gives out energy that was locked within it. So would other atoms if they were broken up. The astronomers who study with the physicists the breaking-up of atoms and the scattering of their electrons, think that in the tremendous furnaces of the stars this breaking-up may continually take place; and thus a star, which is a Sun greater or smaller than ours, may be given a second life. Who, then, can put a period to the life of the Sun, from which the Earth draws its sustenance?

THE WORK OF THE SUN AND THE MOON IN THE SHAPING OF THE EARTH

The nearer future of the Earth can be learned only from its past. In our geological chapters we have sketched its history since it solidified from the liquids and semi-liquids of the Solar Nebula. We have seen the Moon torn out of its side to slip farther and farther away from its parent, and the Earth itself gradually assume its shape of a not quite regular orange. Then, when immunity from further catastrophe was secured to it, and it could pursue its way in comparative peace, the Sun and the Moon began to develop it in a new way. Through all the

ages when its unsettled surface moved and rolled, perhaps as that of the planet Jupiter does now, these two forcible bodies pushed and pulled the Earth about with their gravitative attractions. There came a time when the Earth was surrounded by vapour of water; there came another age when the waters above the firmament were divided from those below the firmament and the Earth begat oceans. The Earth was now growing old, but at this point it renewed its youth, for now the modern Earth was to begin.

The Sun and the Moon, continuing their work, had now new materials to work on. They raised the winds. They stirred the waters. As they began, so they have continued to this day, supporting the circulation of the Earth's atmosphere, compelling the motion of its ocean tides. Through these agents they carved the Earth's surface, rubbing it down with the winds, scouring it with the rains and the rivers and the seas. The Earth, still groaning from the pangs of its birth, and still not released from its growing pains, has never quite settled down since. Perhaps it never will, because the eternal pull by the Sun and Moon at its sides keeps it busy.

THE CHANGES FOR EVER TAKING PLACE IN THE EARTH

In the chapters we have read about this side of the world's history may be learned how, under these forces, the shapes of the continents have been changed; how land has sunk into sea and the depths of the sea have been lifted up till they became dry land and, still rising, were carved into mountain ranges by wind and water. Thus were the geological strata, the chinks, the sandstones, the shales, coal and oil shale, laid down or thrown up; thus are they being made today. The spinning Earth is still crumpling the land masses into new mountain ranges, the old ones may still be sinking, though the action is so slow that we cannot perceive it. The Earth has plenty of time.

Examination of the Earth's crust shows that its formation and deformation go on in much the same way throughout the ages. Climates change, sea-boards alter their outlines, the land sinks and rises; but it did so perpetually in the geological past, and it has continued to do so in historic time. There were Ice Ages, advancing and retreating on the Earth before man or any mammal walked its plains; there have been several volcanic periods, and both Ice

Ages and volcanic periods will come again. The continents will continue to rise and fall, though in the future, as in all but the most remote past, they will keep their main shapes. It has been supposed by some enquirers that the Earth's climate changes as a whole, possibly because the tilt of the axis it inclines to the Sun alters in a million years, and if that were so the summers might be shorter, the winters longer, in one or other hemisphere. The evidence is very uncertain, but if the climate did change in the past for these reasons, the same reasons will recur to change it in the future.

THE HUMAN DESIRE FOR KNOWLEDGE THAT MAKES EARTH THE SERVANT OF MAN

But we are certain of the gradual slowing down of the Earth's spin. The year is growing longer, though only by a second in a hundred years. The time must come when the day will be a year long.

What in those changed conditions will be the future of Man? Here again we can do no more than seek, with what hesitation we may, an answer from the past.

In geological time we have seen great races of animals appear and disappear, not vanishing entirely as a race, but leaving relatives behind to represent them. The Age of Fishes passes and the Age of Reptiles; the Birds arrive, the first perhaps a flying reptile; the Mammals possess the Earth, and then the Chronometer of Creation strikes the hour for man to come. But with his appearance the Earth becomes not the Master of created things, but Man's Servant, for with man is born the divine desire to *know*.

Knowledge, science, these things are the prerogative of man alone among the animals, from whom he is thus eternally different. The animal has no thought but for its surroundings. Man looked up to the stars. His first knowledge, his first science, was astronomy, and he has pushed it to a point when his mind grasps at the Universe of which he is so infinitesimal a part.

HOW MAN HAS MADE A SERVANT OF THE LIGHTNING THAT FRIGHTENED HIM

From the stars man turned his attention to the world about him, continually probing it and measuring it. From time to time a revelation seemed to be accorded him, as when he found that the electricity which lit the lightning of the storm lay at his service beneath his own hand. But commonly his knowledge, beginning with

an idea such as that which the Greek Democritus expounded when he said that all substances, the elements of the Earth itself, was made up of indivisible atoms, has only been confirmed by years of experiment, and, above all, by patient measurement. Sir Isaac Newton found the Laws of Gravitation in that way; in our own time the structure of the atom, the existence of the electron, have been demonstrated by measuring forces and distances; and the greater refinement of the measuring instruments the nearer is the approach to truth. Science tells us that *only that is real which can be measured*.

The waves of sound, the waves of heat, the waves of light—all these have been ascertained, and by such calculation the forces which move the world and all that therein is, have been comprehended. They are not completely understood; they never may be; but every new view of them gained by measuring and experimenting leads the way to surer knowledge.

THE TREMENDOUS FUTURE THAT FIRE OPENED UP FOR MAN

The first great experiment made by man, the first great step in science, was his creation of fire. That at one step lifted him above the animals as high as is the Heaven above the Earth. Fire is power; it is fire, heat, power—for the three things are interchangeable—which have made Civilisation. Fire baked the pottery and the bricks of the first peoples and forged the implements of the Ages of Iron and Bronze. It drives the steamships and the railway trains. It moves the dynamos which turn out electricity. It lifts the aeroplane into the clouds. Without it man would sink back to the Stone Age.

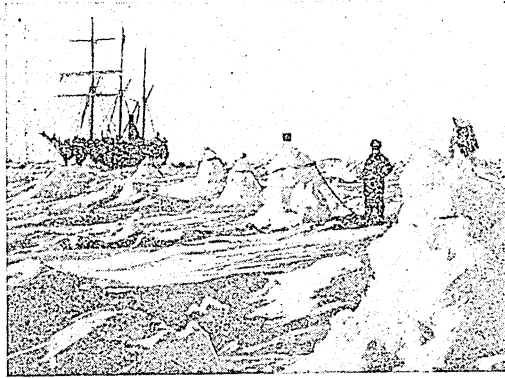
But man will never thus decline. There is no step forward in his history, or in that of the Earth that he inhabits, which has even been retraced. His science stands as a staff by his side; and it is significant of the eternally recurring cycle of events that the scientific energies which he now bends to the structure of the atom, and to the forces within it, resemble his first discovery of fire. It is force that he needs, and fuel that he must have.

Not all man's efforts can thus be simplified, for he is so divinely made that he seeks the things of the spirit as well as the material world. In a word, he seeks Truth, and Truth is the end of all knowledge, and of all that our wonderful Earth can teach us

THE HARD LIFE OF THE ANTARCTIC



SHACKLETON AND HIS PARTY SPEND
A NIGHT ON AN ICEBERG



PILLARS OF SNOW ERECTED BY SHACKLETON'S
MEN TO GUIDE THEM IN SNOWSTORMS



A NARROW ESCAPE FROM DEATH IN SCOTT'S
FIRST ANTARCTIC EXPEDITION



SHACKLETON OUTSIDE HIS TENT
ON ELEPHANT ISLAND



COMMANDER EVANS, WHO TOOK CHARGE OF
THE EXPEDITION AFTER THE DEATH OF SCOTT



LEAVING ON THE WIND—A MEMBER OF
MAWSON'S EXPEDITION PICKING ICE

The Story of Immortal Folk Whose Work Will Never Die



Sir Douglas Mawson



A. de Gerlache



Roald Amundsen



Admiral D'Urville



Captain Scott



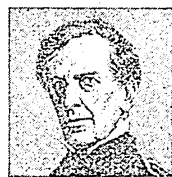
James Weddell



Sir E. Shackleton



F. von Bellingshausen



Charles Wilkes



C. E. Borchgrevink

THE SOUTH POLE MEN

ANTARCTICA lies entirely under ice; the site of the South Pole is from a thousand to two thousand feet deep beneath this frigid mail; and of the 14,000 miles of coast only 4,000 miles are free from ice, which in places forms enormous unbroken cliffs facing the sea, hundreds of feet high. Amid this scene of eternal cold, as we think of it, great mountains throw up their heads, some of them, like Erebus and Terror, being active volcanoes, living furnaces covered with ice and snow.

The knowledge we have of this part of the Earth is the result of more than a century and a half of desperate endeavour. For, though the temperate continent that was dreamed of by the ancient Greeks, and still firmly believed in by Cook's contemporary, Dalrymple, does not exist, Antarctica is a continent, a land mass as big as Europe and Australia put together. And it was once the fair land of the voyager's vision, for, though more than three parts of it is yet untrod by man, several seams of coal have been found on the mainland, attesting the existence of luxurious forests and blazing sunshine in ages long ago.

We may some day draw coals for heat from this land of fearful frost and paralyzing blizzard; in fact, the material motive

which urged the commercial pioneers into the seas that wash these shores was the need for heat and light. We had no gas; oil was the source of light, and seals and whales were the source of oil! So it was Southward ho! that men went, on dreadful voyages of hardship, sickness, and peril. It was the whalers and sealers who more and more pieced together knowledge of the Far South, discovering South Georgia, the South Shetlands, and other islands, all of which were believed at the time to be actual mainland.

Many of these sea hunters were fine spirits, touched to a sense of the romance and mystery of their calling, who added genuine exploration to the hard and hazardous chase of oil-charged sea mammals. Such men were John Biscoe and James Weddell, typical whaling captains, who, in turn, reached the Antarctic in their tough little cockle-shell ships.

Exploration of these seas went slowly on for a century and more by South-seeking Vikings who never saw a steamship. Indeed, it was not till the Challenger expedition pushed South in 1872 that a steamship crossed the Antarctic Circle. It was men of the Cook and La Pérouse stamp who did the pioneering. Cook was the first man to cross the Antarctic Circle, on January 17, 1773. Then there were

EXPLORERS · INVENTORS · WRITERS · ARTISTS · SCIENTISTS

men like the Enderby Brothers, whose name lives on the map, men who always hoped that if the voyages of exploration they promoted were commercially unprofitable, some new island, some archipelago, even the legendary continent itself might turn up to justify the risk. It was the old merchant adventurer spirit of the days of Elizabeth, surviving into the nineteenth century, and one of those agreeable weaknesses which have helped to build up the British Empire.

THE ANTARCTIC VOYAGE OF A ROUND-THE-WORLD TRAVELLER

We have not yet noted a fine name, that of Captain von Bellingshausen, who, having sailed round the world in 1803, led a Russian expedition to the Antarctic, and from 1819 to 1821 got as far South as 70 degrees, discovering and naming Peter the First Island and Alexander the First Land. Minutely acquainted with Cook's work, he carefully supplemented it, and confirmed the impression that south of latitude 60 there was continuous open sea surrounding the ice pack which girdles the frozen continent.

Weddell reached beyond 74 degrees South, and discovered the great bay which now bears his name; Biscoe named Enderby Land and found Graham Land, Adelaide Island, and Biscoe Islands. John Balleny, another captain sent out by the Enderby Brothers, reached what we now call Balleny Islands. Then came the French naval officer D'Urville, with his three years' voyage, and close on his heels followed the American Wilkes and Ross. It was D'Urville, by the way, whose name is commemorated in that of the D'Urville Sea, to whom the world owes the discovery and preservation of the famous statue of the Venus de Milo, which he found in the Island of Melos in 1820.

THE EXPLORER WHO NEARLY MADE A WAR BETWEEN BRITAIN AND AMERICA

The three expeditions, French, American, and English, were in progress simultaneously, crossing each other's tracks. Charles Wilkes surveyed, as far as possible, the coast of Wilkes Land, which has a northern limit beyond the Antarctic Circle, and embraces Adélie Land, which D'Urville had already reached and named.

Wilkes was unfortunate in his ships, and in his relations with his officers and crew, who alleged that he was inhumane. He was brought to court-martial on these charges, and was justly acquitted. Twenty

years after his cruise (that is, in 1861) he set the world ablaze by stopping a British steamship on the high seas and taking prisoner two representatives of the Confederate States of America, with which the Northern States were then at war.

The incident was what is known as the Trent affair, the Trent being the name of the British ship. This high-handed action of Wilkes nearly brought war between America and Britain, so that, taking one consideration with another, we must regard him as the stormy petrel of our story.

A greater figure of his time was Sir James Clark Ross, whom we have already met in the Far North, discovering the North Magnetic Pole. The Admiralty sent him, in 1839, to discover the South Magnetic Pole, and in the course of the greatest cruise then accomplished, in and through the ice, he enormously advanced our knowledge.

With his two little ships, the Erebus and Terror, he battled with floes and bergs, with unknown tides and desperate winds. He sailed straight for the Magnetic Pole till land brought him up at what we now call Cape Adare, where he espied a mountain rearing its icy head 10,000 feet into the skies. This he named Mount Sabine after a brilliant scientist of the day.

FLAMING VOLCANOES WRAPPED IN COATS OF ICE

The Ross Sea marks another of his discoveries, and others were the Admiralty Range, Possession and Coulman Islands, and two flaming volcanoes, which he named after his ships, Mount Erebus and Mount Terror. East of a cape which he named Crozier, after his second in command, Ross surveyed a great stretch of the ramparts of the land, the famous Great Ice Barrier, as well as finding and naming South Victoria Land. Then, after thrilling adventures, he came back the first man to take a ship beyond 75 degrees South latitude.

The next ship in the Antarctic Circle was the steamship Challenger, under the command of Captain Nares, in 1874, when the Great White Silence had been left solitary for thirty years; and after that a further twenty-one years passed before a second steamer appeared in the same region. But it was the frisky little sailing ships that first let light into the Antarctic mysteries, and it was in little wooden sailers that seamen still believed.

THE SOUTH POLE MEN

For as soon as the Erebus and Terror reached England after a cruise of nearly four and a half years, little the worse for their battering by ice or by collision in the dark when avoiding a nip between two icebergs, they were claimed by another heroic spirit, Ross's old friend, Franklin.

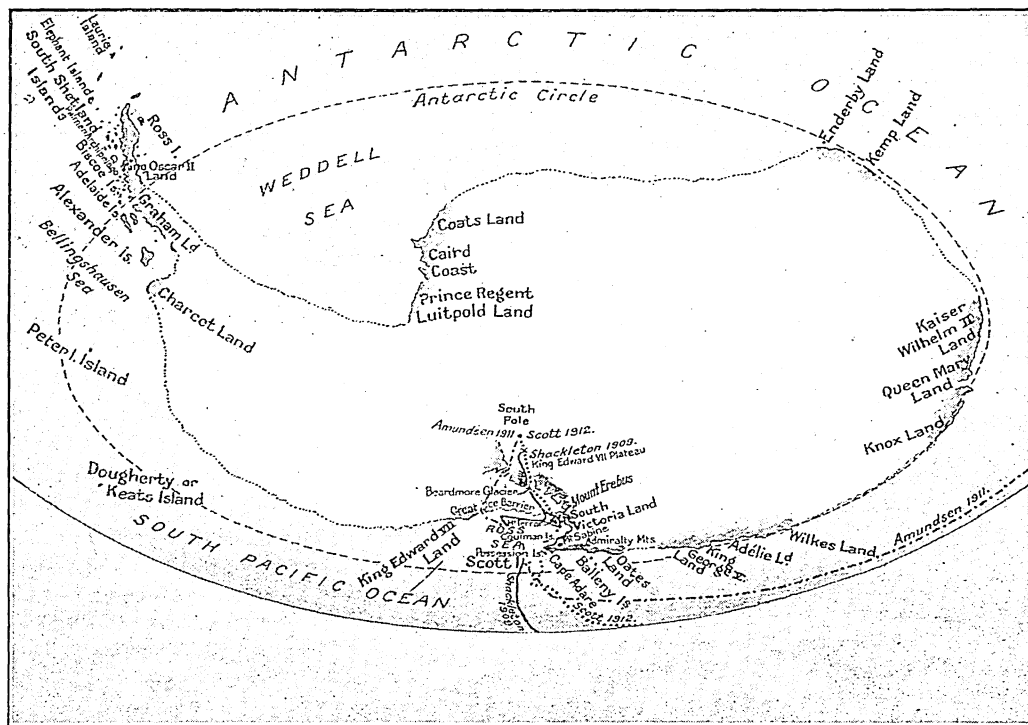
It was the two little ships which had been Farthest South that Sir John Franklin chose for the most tragic of all Polar voyages, the voyage which ended in the loss of himself and all his men as they battled their way through the terrible North-West Passage.

So far, all the voyages into the Antarctic had been in the nature of seasonal visits, south of the Circle for a short

though amply fed. Vitality sank, spirits dropped to zero, men's minds wavered and tottered, and death boarded the little steamer, Lieutenant Danco passing away in the darkness. Light returned in July, but the ship remained frozen in until January, 1899.

The event was remarkable ; so was the personnel of the ship. For her mate was Roald Amundsen, future discoverer of the North-West Passage and of the South Pole. And of the company, too, was Frederick Albert Cook, who was to win ill-fame in 1909 by pretending to have gained the North Pole in advance of Peary.

Winter having been passed by a crew in the Antarctic Ocean, a Norwegian, in



THE REGIONS AROUND THE SOUTH POLE AND THE WAY THE EXPLORERS WENT

summer, then north to safety for the winter, and back again when light and warmth returned to the higher latitudes. But the long sequence was broken for the first time, in 1897, when the Belgian expedition in the Belgica, under Adrien de Gerlache, sailed South. They lingered too long over scientific observations on the way down, and to their amazement, when in mid-ice within the Circle, on May 15, they lost the Sun, not seeing it again until ten weeks had gone by.

The Antarctic winter had caught its first ship! The crew suffered extremely,

Carsten Egeberg Borchgrevink, who settled in Australia in 1888 and did some notable seal-hunting from there, came home to England, and in 1898 commanded the expedition in the Southern Cross, sent out by Sir George Newnes, the first ever to winter on the Antarctic mainland.

The experiences differed little, as to cold and desolation, from those of the Arctic, but there was this difference—the utter absence of visible life in winter, save an occasional Emperor penguin.

In summer there are penguins nesting near the shores, and there are seals.

grampuses, and other whales in the water ; but in winter nothing to take the place of the Arctic bears, foxes, musk-oxen, reindeer, and sea birds ; no human soul such as the Eskimo.

Borchgrevink's adventure was a picturesque and gallant one, unattended by notable geographical results, but memorable for another reason than the fact that it was the first expedition to winter ashore. Nikolai Hanson, a Norwegian, the naturalist of the party, who had quitted a post at the British Natural History Museum to join the ship, slowly sank and died before summer returned, and was buried in one of the strangest graves in the world.

Before he died he named the site of his tomb : " It shall be where I was photographed last year, beside the boulder on the summit of Cape Adare—there, on the leeside of that stone."

And so it was. His friend, Louis Bernacchi, a Tasmanian scientist, began the digging of the grave, assisted by two Finns, who were in charge of the dogs. In a full day's work they dug but four inches. Next day they blasted with dynamite, and eighteen inches down came upon a buried glacier, which must have been there, unmelting, unaltered, unrevealed, for centuries.

THE WONDERFUL PROCESSION OF PENGUINS WHICH LASTED 14 DAYS

In that concealed glacier beneath the windswept boulder, wrapped in the Norwegian flag, Nikolai Hanson was buried, his grave being 65 inches deep in the hidden ice. Hanson was a descendant of the Vikings whose dead were the first white men interred in America, over a thousand years ago. Strange thought his sorrowing comrades, that this later Viking should have come almost to the opposite extremity of the Earth to find *his* sepulchre.

Eskimos witnessed the Viking burials in America ; the two Finns witnessed this Antarctic interment ; and with grief in their hearts they raised native songs of mourning, perhaps songs not unlike those which their Eskimo kindred sang in the far-off days of Viking discovery in the New World.

The Southern Cross party were the first to witness the arrival of the penguins. They met millions of them where they had marched inland over the ice, twelve miles from the sea, and for fourteen days the procession of birds went on in unbroken

continuation, all the twenty-four hours of each undarkened day and night.

The Southern Cross steamed to the highest latitude yet attained, and the leader and a comrade made a short sledge journey on land, reaching 78 degrees, 50 minutes South, and with that record the nineteenth century closed.

The twentieth century brought into prominence two figures destined to win immortal fame by their achievements and their heroism. They were Robert Falcon Scott and Ernest Henry Shackleton.

THE DELICATE DEVONSHIRE BOY WHO WAS TO WIN IMMORTAL FAME

Scott was of the great Devonshire line of seamen, born at Outlands, Devonport, in June, 1868, a weakly boy whom it was difficult to rear beyond infancy ; a boy who, as he told us in his last diary, " had to force himself into being strenuous, having always an inclination to be idle." Yet he was in the Navy at 13, and at 33 had so fine a service record that he was appointed in 1901 to lead the Discovery expedition, taking with him Shackleton, Dr. E. A. Wilson, and others who also were to win undying fame.

Scott landed at the foot of Mount Terror on Ross Island, and, his ship turning eastward along the Great Barrier, discovered a great new territory which he named King Edward the Seventh Land. Ross had given the name of South Victoria to his great land discovery, meaning that the whole of the Antarctic continent should bear that title, but too many discoveries were being made for such a plan to be followed, and presumably Antarctica will for ever remain its official designation.

Scott wintered in McMurdo Sound, and in the spring, accompanied by Shackleton and that knightly spirit, Wilson, set out on the first great sledge journey South. Over dreadfully rough and dangerous ice the party proceeded for 370 miles due south without being able to reach the mainland.

THE TERRIBLE JOURNEY WHICH SHOWED SCOTT THE WAY TO THE POLE

He had ever in sight the great mountain range which continues South Victoria Land to the South, but the loss, one by one, of nearly all the dogs, the exhaustion of food supplies, and the breakdown through scurvy of Shackleton, drove the party back, and they returned after fifty-nine days of deadly peril and hardship, victorious in this, that Scott had

MEN WHO REACHED THE SOUTH POLE



CAPTAIN AMUNDSEN TESTING HIS POSITION
AT THE SOUTH POLE



AMUNDSEN'S COMPANION, OSCAR WISTING,
AT THE SOUTH POLE WITH HIS DOGS



CAPTAIN OATES WALKS OUT INTO THE BLIZZARD—FROM THE PAINTING. A VERY GALLANT
GENTLEMAN, BY J. C. DOLLMAN

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discovered a way to the South Pole itself. In the following year he marched 300 miles west over Victoria Land, and was home again in England by 1904, with a great record of work achieved, but pining to be off again to the scene of his labours.

Shackleton was the next to venture forth, as commander of the *Nimrod*, and reached Cape Royds towards the close of the Antarctic summer in 1908. He was compelled to land here in a hurry, as he found the path to King Edward the Seventh Land blocked by ice, and there was a danger of coal failing before his ship could get away for the winter.

The seemingly solid ice on which stores were landed suddenly broke up under the swell of the sea, imperilling not only the stores, but eight Mongolian ponies which Shackleton had taken for sledge work. A gale raging at a hundred miles an hour nearly wrecked the ship, and covered the shore with spray which instantly turned to ice.

THE DEADLY FURY OF THE GALES THAT RAGE IN ANTARCTICA

Waves that broke over the ship immediately froze and became ice a foot thick, and as some indication of the power of the gale it may be noted that a Russian boot, weighing seven pounds, was torn out of the crate in which it was lying and blown three-quarters of a mile.

However, such things are part of the everyday life of the Antarctic, where summer temperature is never above the freezing-point region, where men lose themselves and are blown away if they walk but a few feet in the darkness of the long winter night, and where the wind is such that, in standing to cut ice with a pickaxe, a man can actually lean on the wind; and, indeed, must do so to maintain his position.

Shackleton adopted Scott's route for the Pole, and ought to have gained it at the first dash but for one fatal error. He relied on ponies instead of dogs. The ponies, lacking the salt which they were accustomed to lick on their native steppes, ate the salt sand, and it killed four of them. So the pulling power of the party was insufficient and progress too slow for the food supply.

Nevertheless, Shackleton made a superb march over Beardmore Glacier, and on January 9, 1909, reached, on King Edward the Seventh Plateau, a position 420 miles South of previous records. They were

within ninety-seven miles of the Pole, but a furious gale raged for sixty hours and nearly killed them all. Food was short, vitality was ebbing so that bodily heat could not be maintained, even under full pressure of man-hauling the sledges after the death of the last pony.

MAWSON'S THIRST FOR KNOWLEDGE WHILE HE LAY IN SIGHT OF DEATH

So the party turned back and reached the base just alive. In the meantime, a second party from the expedition, Professor T. W. Edgeworth David, Dr. A. F. Mackay, and Dr. Douglas Mawson, had made a terrific journey over glaciers and treacherous ice fields, and on January 16, 1909, in 72 degrees 25 minutes South, 155 degrees 16 minutes East, discovered the South Magnetic Pole.

That journey alone was an epic of terror and triumph. The ice lay in folds which were really little hills, and was seamed with crevasses, some of them the more dangerous because covered with snow lids. Into one of these Mawson suddenly plunged, suspended ten feet down by his sledge harness. In imminent danger of death, he occupied the time while he was being rescued in picking off ice crystals of a new formation from the walls of his death-trap, and threw them up to his comrades, in case he should not survive to examine them at his leisure.

THE YORKSHIRE LAD WHO WENT TO AUSTRALIA AND FOUND FAME

Here we must tell of another of the adventures of Sir Douglas Mawson, as he later became. A Yorkshire boy, he went to Australia in his youth, became a brilliant scientist, carried out a geological survey of the New Hebrides at 21, was with Shackleton at 26, and in 1911, when 29, led the Australian expedition to Adélie Land in the *Aurora*. His personal contribution to the knowledge of our subject was the discovery and exploration of what he called King George the Fifth Land, but we must follow him in a sledge journey of extraordinary difficulty.

In the summer of 1912 he set out with two dog teams, accompanied by Xavier Mertz, a dashing scholar-lawyer who was the champion ski-runner of his native Switzerland, and by a towering young Englishman, Lieutenant Ninnis, one of the fine products of Dulwich College.

The little party progressed with difficulty over land covered with ice and snow, converted by hurricanes into hillocks,

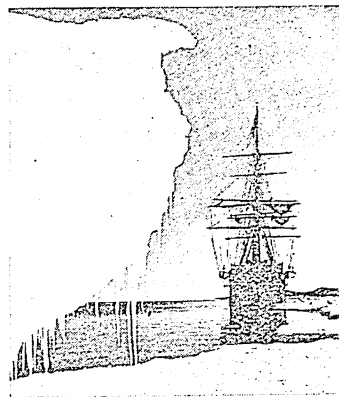
WITH CAPTAIN SCOTT IN ANTARCTICA



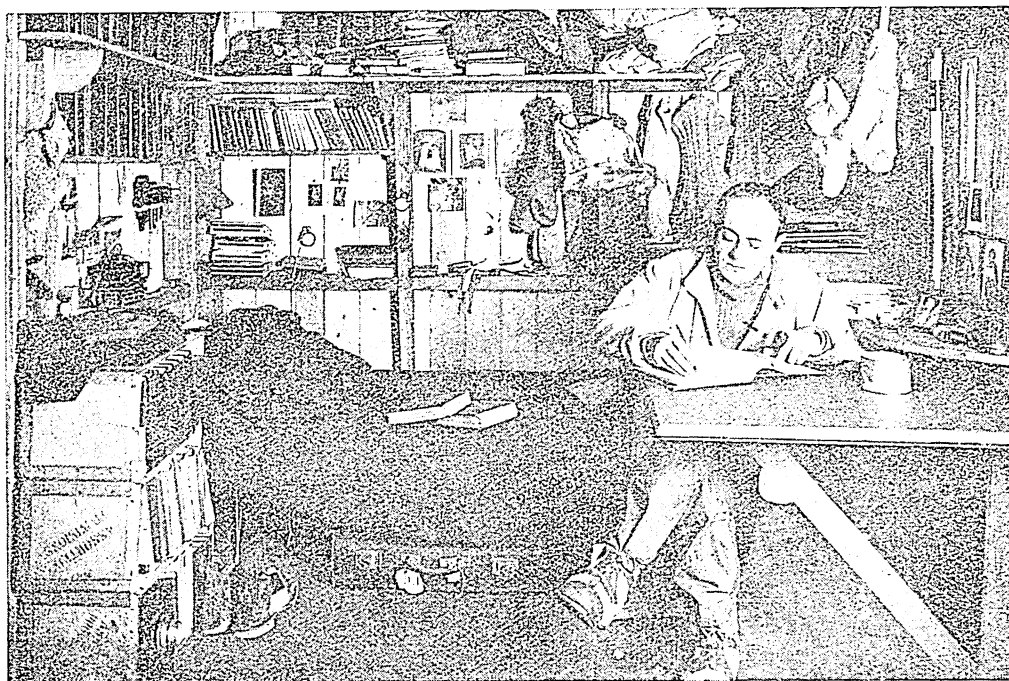
A GLACIER CAVE NEAR LAND'S
END. ANTARCTICA



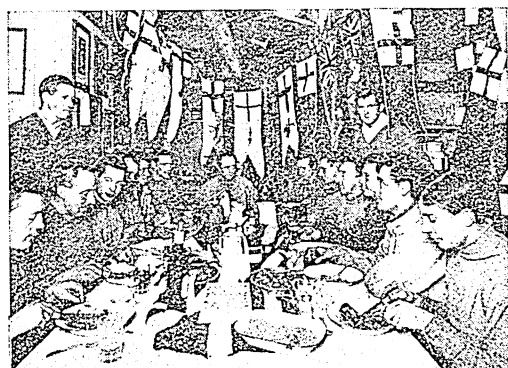
SCOTT AS HE STANDS IN
WATERLOO PLACE, LONDON



SCOTT'S SHIP, THE TERRA
NOVA, IN ANTARCTICA



CAPTAIN SCOTT AT WORK ON THE DIARY OF THE EXPEDITION



SCOTT'S BIRTHDAY DINNER IN THE HEART
OF THE ANTARCTIC



MEARES AND DIMITRI SITTING OVER THE
BLUBBER STOVE IN THE DISCOVERY HUT

swells, and ridges, which looked as if a turbulent sea had suddenly become rigid. Everywhere crevasses abounded, covered by snow, and descending hundreds, even thousands of feet.

A MAN WHO DISAPPEARED INTO THE DEPTHS OF A YAWNING CREVASSE

On the thirty-fifth day out, when they had covered 315 agonising miles, Ninnis suddenly disappeared down one of these crevasses, carrying with him the best dog team, with the sledge on which were nearly all the food for the men, all the food for the dogs, and nearly all the implements. Six emaciated, foodless dogs remained, a tent but no tent poles, a cooking-stove and oil, but only a little pemmican and some thirty-five pounds of almonds and raisins.

All that day Mawson and Mertz endeavoured to reach their lost comrade, but save a faint whimper from one of the dogs which they saw lying on a ledge with its back broken, 150 feet down, and a blurred outline of the sledge, they could discover nothing. Their ropes were far too short to reach down the crevasse to where Ninnis must have fallen. There was no sound from him. Death must have come with merciful suddenness to the brave fellow as he fell headlong into his grave.

The survivors turned homeward in a desperate plight. An abandoned sledge which they had thought useless was found on the trail and broken up with spare skis to make poles for the tent. One by one the starving dogs died, and part of their flesh was given to the remainder, part was eaten by the men.

DR. MAWSON'S THRILLING JOURNEY ACROSS A HUNDRED MILES OF ICE

Finally, the last dog died, and the two men dipped deeper into their sledge rations, such as they were; boiled snow for water and soaked in it bags which had contained tea or cocoa. Then poor Mertz sickened and died, and Mawson was alone in that horrible land, with a hundred miles to go, a few handfuls of raisins, and the carcase of a dog for food, and the sledge with its tent, lamp, and oil to be dragged single-handed, up ice-hills, down ice-hills where it shot, and again and again pulled him with it, sometimes into crevasses, sometimes over them.

Once he dropped six feet into one of these yawning chasms, hung by his harness and spun. He managed to pull himself

up, but on reaching the top fell again, freezing, exhausted, dying, intolerably burdened with snow and ice which had broken and fallen on him. And yet once more he hauled himself out, feet first this time, then lay trembling and faint, motionless for an hour on the crumbling brink of the awful ice-pit.

Somehow he managed to struggle on, and then, when he had only two pounds of food left, he came upon a depot of supplies left by men who had departed only six hours before his arrival. Then there was a frightful journey down over the ice plateau in such a wind that with his smooth shoes, he was blown miles and miles out of his course, till he broke up his wooden instruments, left the nails projecting, and used these as grappling irons for his feet.

At last he reached the base—to find that his ship had sailed, leaving five men and stores to sustain him during the now approaching winter. All's well that ends well! In the spring of 1914 his ship reached him again and he returned to civilisation after the most appalling experience of the kind that any man had ever lived to tell.

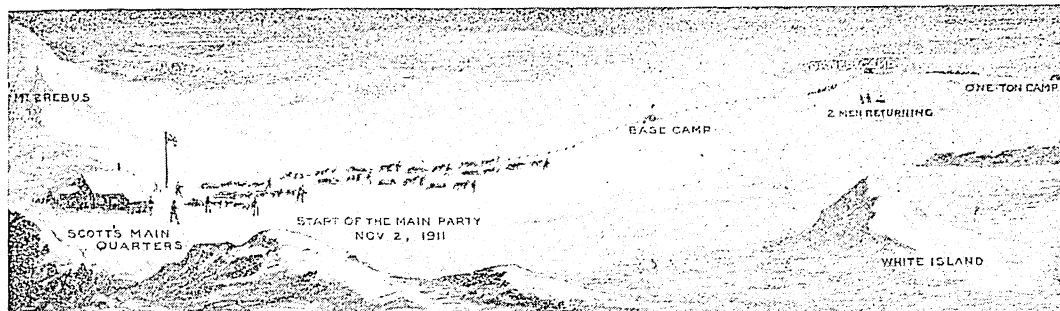
SCOTT AND AMUNDSEN, AND THEIR CLOSE RACE FOR THE SOUTH POLE

Now we must return to Scott and his affairs, merely noting the discovery by Professor Erich von Drygalski of Kaiser Wilhelm the Second Land, the wintering of Dr. Otto Nordenskiöld in King Oscar the Second Land, the wintering of Dr. W. S. Bruce at Laurie Island and his exploration of the coast of Coats Land, and excellent minor work by Dr. Jean Charcot in the Palmer Archipelago, and later, in Bellingshausen Sea.

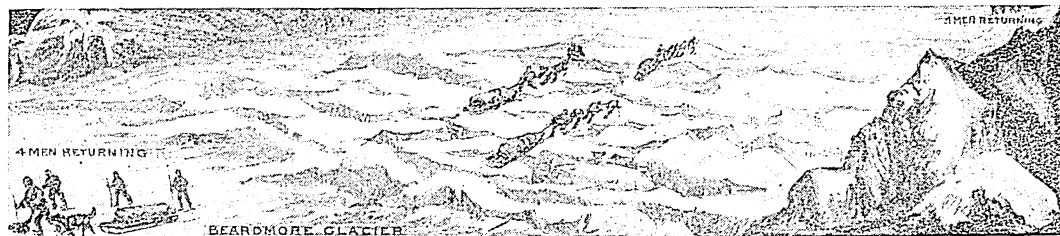
It came to a race for the South Pole after all, and Captain Roald Amundsen won. He had set sail for the North Pole, but, learning that Peary had already succeeded there, he secretly made his way across the world, and, fortified by the knowledge of routes and conditions which Scott and Shackleton had published, attacked the problem from the Bay of Whales on the edge of the Great Barrier. He wintered there, and on October 20, 1911, set out with dogs and men on a final dash for the Pole.

Like Peary, he had marvellous fortune. Instead of the dreadful weather which was to doom Scott to death, he had mainly fair going, though he had to march

THE IMMORTAL STORY OF CAPTAIN SCOTT



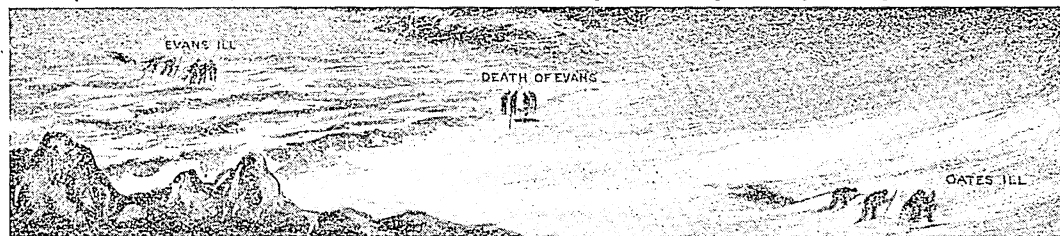
The departure from their base of Captain Scott and his companions with dogs, ponies, and provisions, for their dash to the South Pole. The distance to One Ton camp was 100 miles.



The difficult ascent of the Beardmore Glacier by a dozen men, seven of whom returned to the base on reaching the vast plateau on which the Pole is situated. Five men made the final dash.



The party at the South Pole, which was reached on January 18, 1912. Here they found a letter from Captain Amundsen, who had arrived a month before. Captain Scott spent a day making observations.



The first disasters on the homeward journey—the illness and death of Petty Officer Evans on the Beardmore Glacier, his burial at the foot of it, and the illness of Captain Oates.



The heroic self-sacrifice of Captain Oates, who walked out into the blizzard to die. The final effort of Scott, Wilson, and Bowers, and the scene of their death in a tent but eleven miles from One Ton camp.

through blizzard spells which few but these Vikings would have been tempted to encounter.

There were deadly dangers, too, from crevasses. Perhaps the most sensational scene of all was when one of the party, Helmer Hanssen, fell with his sledge, himself into a crevasse six feet wide, the sledge slanting across it, the dogs, safe across. It required but a movement or two to send the whole lot, man, sledge, and dogs, spinning down, and that movement was threatened by the dogs which fought, as they always fight at the least provocation.

Like a lot of roaring tigers (says Amundsen) the whole team set on each other till the hair flew. If this went on all was irretrievably lost. One of us jumped the crevasse and fortunately got them to stop. At the same time Wisting threw a line to Hanssen and hauled him out of the unpleasant position.

THE EIGHTEEN DOGS WHICH REACHED THE POLE WITH AMUNDSEN

The quarrelsome dogs won the Pole. The hapless ponies lost it for England. Of the fifty-two dogs with which Amundsen started, he killed twenty-four when the worst of the hauling was over, and ate them. Eighteen reached the Pole, pulling marvellously up the frightful slopes, as if they knew the glory attaching to their feat. Twelve reached the home base once more, triumphant.

When rather more than half the journey had been covered, the party had to climb a mountain range over 10,000 feet high, and up it they went with their terrific sledge-loads. Man and dog work together as to the manner born when the man is of the Norse tribes, and so it was here. After this climb they dropped 3000 feet, and next had to surmount another glacier high and perilous. Then they were on a plateau which for the next 120 miles sloped gradually downwards to the Pole.

Roald Amundsen reached the South Pole on December 14, 1911, and the dream of ages was realised, but not by the nation which had done most to bring it about, not by the nation which had found the way and borne the cold and burden of the many heart-breaking years of effort. But we all admire the magnificent skill and intrepidity of Amundsen's superb achievement.

Meanwhile Captain Scott had sailed from London in the Terra Nova in June, 1910, two months before Amundsen had turned his ship about from the North to

the South. He wintered on Ross Island again. During the spring depot-laying parties got far forward, but from the outset Scott met difficulties.

The weather was of exceptional severity; the sea ice over which stores had to be carried broke up, and ponies were lost in this way, huge grampuses seizing others, and some being killed with pick-axes to save them from so horrible a fate.

HOW THE GLORY OF FINDING THE POLE WAS LOST FOR ENGLAND

So half his haulage power was lost at the base, and, the weather continuing bad, Scott delayed his start in order to spare hardship to the remaining ponies.

Dogs would have got him through, all seasoned Antarctic men say; ponies doomed him. On the great march for the Pole, which was begun on January 4, 1912, the ponies were used up and had to be killed one by one before half the journey was accomplished. Then the Pole party had to do the hauling, up mountains, over glaciers, across heavy ice and snow, by themselves.

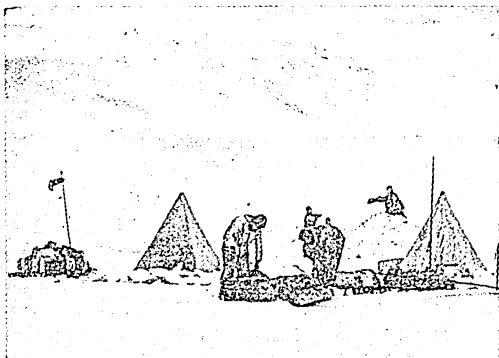
The names of that party live for ever in our affections. There was Scott himself, so brave, so gentle. There was Dr. E. A. Wilson, the surgeon and artist, who was perhaps the most beautiful spirit that ever adventured into these horrid wilds. He was profoundly learned, he had the philosophy of a sage, the religion of a saint, the courage of a lion, and the gentle, loving nature of a child. They called him "Uncle Bill" and loved him wholeheartedly.

SCOTT'S SPLENDID COMPANIONS ON HIS LAST SAD JOURNEY

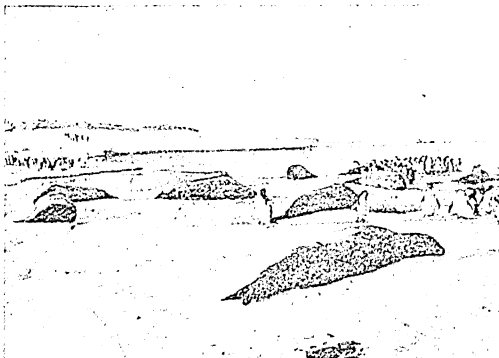
Then there was cheerful Lieutenant H. R. Bowers, a midget giant, whose spirits mounted the higher for every difficulty encountered; Captain L. E. G. Oates, a twentieth-century Bayard, without fear and without reproach; and Edgar Evans, a typical British seaman, a handsome, upstanding fellow, with the strength of a horse and full measure of amiability, which Amundsen holds to be the crowning asset of a Polar man. Courage, he says, is a common virtue; allied with amiability it forms a blend of human qualities equal to any feat.

Such was the British Polar party to whom the last of the supporting expeditions said a blithe farewell on January 3, 1912, when Scott expected to be at the Pole in a fortnight.

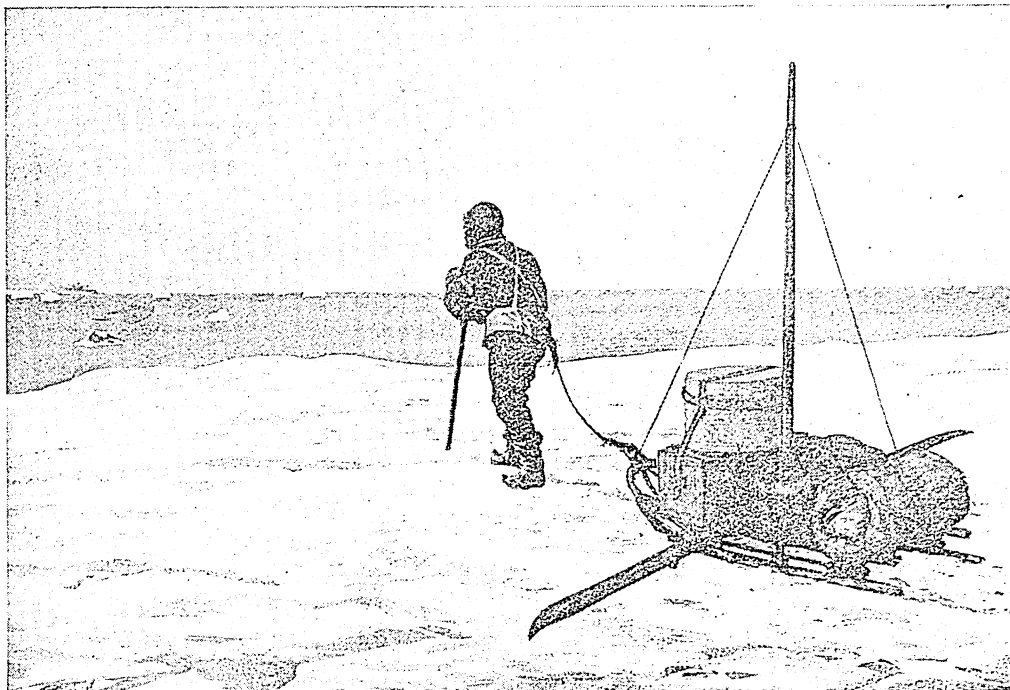
PICTURES OF THE MAWSON EXPEDITION



BUILDING A DEPOT IN ADÉLIE LAND FOR THE EXPEDITION OF SIR DOUGLAS MAWSON



THE KIND OF LIFE SIR DOUGLAS MAWSON FOUND ON THE MACKELLAR ISLETS



SIR DOUGLAS MAWSON AT THE END OF HIS TRAGIC JOURNEY, AFTER THE DEATHS OF NINNIS AND MERTZ



PICKING THE WAY ACROSS SPLINTERED ICE NEAR CAPE DENISON



THE AURORA LYING AT ANCHOR IN COMMONWEALTH BAY

Many of the pictures on these pages are reproduced from Sir Douglas Mawson's book *The Home of the Blizzard*, published by Heinemann; others are from photographs by Mr. Herbert G. Ponting

For thirteen months nothing was heard of them. Dead men's diaries tell us all there is to be known. From those records it is shown that the gallant five marched straight on to the South Pole. They reached it on January 18, 1912, to find their triumph dashed by the bitter knowledge that another had preceded them. At this loneliest place on Earth they found a tent and a message written in Amundsen's hand: "Welcome to 90 degrees!"

THE BITTER CALAMITY THAT OVERCAME A LITTLE BAND OF HEROES

A letter from the same pen informed Scott that Amundsen had attained the Pole a month ahead of himself. With this was a letter to the King of Norway which Scott was asked to forward. Scott brought it back and it lay with him in the tent of death and was ultimately delivered to its address.

For it was to death that our heroes walked. Sad and heavy-hearted, they turned homeward with something of forboding. Summer though it was, the weather was bitter; the ice was as rough as files, and pulling was terribly exhausting. We know now, from more recent experience, that even their full rations were insufficient for their task.

But they were delayed by the unexpected breakdown of the mighty Edgar Evans, worked half to death. He lagged, poor fellow, and held them back; then, to make matters fatally worse, had a serious fall on Beardmore Glacier, dying on February 17, and so dooming the party, for they could not pull the great weight of sledges without his herculean strength.

THE PATHETIC TRAGEDY OF A VERY GALLANT GENTLEMAN

Worse and worse grew the weather, hurricanes, blizzards, intense cold. Oates was terribly frost-bitten about the feet and could not pull; indeed, he could hardly walk.

"What shall I do? What *can* I do?" he pitifully asked Dr. Wilson. "Just slog on, old man," answered Wilson. But for all his slogging, poor Oates was retarding his friends, dooming them to death, and he knew it. So one morning, when the blizzard was raging mercilessly, he said to his friends:

"I'm just going outside, and I may be some time." He tottered forth, never to be seen again.

"We knew that Oates was walking to his death," wrote Scott, "but though we tried to dissuade him, we knew that it was the act of a brave man and an English gentleman."

So he wandered into the bitter frost and storm to die, in order that his friends might have a chance to live.

It was in vain. Scott, Wilson, and Bowers, with breaking hearts, strove onwards to the north. The storm was continuous. Snow, fine as sand, mixed with snow sharp as steel filings, drilled and scoured their faces, filled their clothes, made breathing almost impossible.

They came to a point eleven miles from a generously provided depot, One Ton Camp, but the pitiless elements drove them for shelter, where they were, to their little tent. They camped with fuel for one hot meal and food for two days, but the blizzard raged for more than a week and held them there to die—within a single march of plenty.

THE WONDERFUL DIARY SCOTT KEPT IN HIS TENT OF DEATH

In spite of starvation and cold Scott and his three companions lived for four days in the tent. They wrote their last letters of farewell, they made up their diaries. Scott, with a spirit superior to every ill, wrote a noble message telling of the cause of the disaster. In proud humility he set down the reasons for the failure. They died, he said, as strong, unfortunate men, not as blunderers. He dedicated beautiful tributes to his comrades dead around him. In his last extremity this extraordinary man composed his mind to the penning of tender words of loving sympathy to the relatives bereaved by the tragic end of his followers.

Various evidences show that his strength survived that of Wilson and Bowers, and that he was the last alive. With his ultimate flicker of strength he kept his diary, and then, when his turn came to die, he unfastened the top of his sleeping bag, released the collar about his throat as if to get more air, and passed away with one arm outstretched to retain contact to the end with the dead body of his beloved friend Wilson.

But what of the others, that the Polar party should die so near and yet so far from help? Tragedy is made still more tragic by the fact that a relief party was at One Ton Camp from March 3 till March 10, when, the weather becoming dangerous, they dared not stay longer lest

THE SOUTH POLE MEN

they should eat too much of the food stored there for Scott. They retreated eleven days before Scott reached his last camp. Could they have carried food one stage farther, all would have been saved, but the precaution appeared unnecessary.

From the time of the tragedy eight months passed. Then on October 30, 1912, a search party which included Mr. Cherry-Garrard, went out under Dr. Atkinson, with Mr. C. S. Wright as guide, and on November 12, they found the silent tent. They found it almost by divination rather than by sight

Wright came across to us. "It is the tent." I do not know how he knew. Just a waste of snow; to our right the remains of last year's cairns, a mere mound. We walked up to it. I do not think we quite realised. There were three men there. We never moved them

There they were, as they had died, with their papers and diaries about them, with not a particle of food, but with the sledges containing thirty-five pounds of fossils which these devoted souls had sapped their strength to haul, trophies of their journey—coal, fossil wood, rare minerals, even fragments of coral. In that last march to death they had not forgotten that they were scientists as well as explorers, and they hauled their prize of burdensome specimens as if they had been holy relics.

Search was made for the body of Oates, but the snow had swallowed it. A cairn was set up to mark the approximate site of his sacrifice, with these simple words:

Hereabouts died a very gallant gentleman, Captain L. E. G. Oates (Inniskilling Dragoons). Who, on their return journey from the Pole, in March 1912, willingly walked to his death in a blizzard to try to save his comrades beset by hardship.

As for Scott, Wilson, and Bowers, their bodies were allowed to lie where life had been withdrawn from them. There they lie embalmed in ice, hundreds of miles from the sea. But if their souls go marching on, so do their bodies. The great ice-sheet of the continent moves. When Shackleton's expedition went to seek the site a few years later the tent of death was gone.

Scott was the Franklin of the South; shall we say that Shackleton was the Barcnts? He died not in the Antarctic but near it, yet not before he had made history with another amazing feat. Short of the Pole by only ninety-seven miles, and that Pole now gained, he set himself the appalling, and probably impossible task of crossing the Antarctic continent from the Weddell Sea to the Ross Sea, 1800 miles, the route from the Weddell Sea to the Pole being unknown ground.

It is to be noted that one effect of the disaster to Scott was this—that for the fifty-six places available in the expedition, Shackleton received nearly 5000 applications. Before the *Endurance* set sail from London on August 8, 1914, war was declared, and the entire ship and company were offered to the Government for service against the enemy, but were bidden proceed on their journey. They did proceed, and for two years were steeped in the Antarctic mists without word as to how the war was proceeding. Indeed, their first question on being eventually redeemed from the ice, was "How did the war end?" the war being at that time but midway through its dreadful course.

In brief, what happened was as follows. New land was sighted and named Caird Coast, but the *Endurance* was frozen in in January, 1915, in latitude 76 South, and was dragged with the ice for nearly ten miles, when, on October 27, in latitude 69 South, she was smashed to fragments and the whole party were stranded on sea ice. Luckily they saved a large quantity of food and gear, as well as their three boats; but they were adrift, with half a world of ice and sea between them and safety.

For the next three months they slowly floated about at the mercy of winds and currents. They had just enough food to maintain life, for they caught seals and ate the flesh and drank the oil from the blubber; and they killed and ate their dogs. All but indispensable property was thrown away. Men emptied their pockets of sovereigns, half-sovereigns and silver, but kept photographs and letters of loved ones.



Dr. Wilson



Lieut. Bowers



Captain Oates



Petty Officer Evans

THE FOUR MEN WHO WENT WITH SCOTT TO THE SOUTH POLE

From time to time the ice cracked and broke up, sometimes in the middle of the night beneath a tent, carrying away a man in his sleeping-bag. Sometimes huge grampuses charged up from below, smashing ice a yard or more in thickness, and sought to attack them. Once a leopard mounted the ice, but was shot and eaten, while the fish its stomach contained proved one of the most delicious meals of the captivity.

THE TORTURES OF THIRST WHICH ALMOST DROVE MEN MAD

Water had to be obtained by melting ice in the cockers, but when oil began to fail, men put chips of ice in tobacco tins and slept with these next their bodies so as to have a little drink in the morning. Then, when at last the boats were launched and got free of the pack, there was no ice, and, therefore, no drinking supply. Mouths swelled, lips split, food became uneatable, and the men suffered tortures of thirst with forty and fifty degrees of frost around them. When a man was in danger of madness from this cause, he was given raw meat to chew.

At last Elephant Island with its glaciers was reached, and men sucked ice to their heart's content. Here the party was split up. Frank Wild, a hero, was left in charge of twenty-one men on a desolate sandy pit, swept by gales and snowstorms, with only two upturned boats for refuge; but on the barest food supply he kept his men in health and spirits for four and a half months what time Shackleton was bringing help to them.

THE GREAT MARCH OF A PARTY OF STRANDED MEN

Shackleton, with five staunch rowers, made a tremendous boat voyage, horrible in its details of agony and privation, to far South Georgia, through appalling weather, tempestuous seas, ice, gales, enduring bitter cold, wet that soaked everything from clothes to food, and covered the sufferers with sea boils. Yet land was gained at South Georgia, the terrible snowy mountains were crossed, a whaling station was reached, a ship was secured, and, after many trials, Shackleton succeeded in reaching Elephant Island on August 30, 1916, and rescued his party.

There is another phase of this adventure. The Aurora, which should have met Shackleton on his reaching the Ross Sea and placed food depots as far south for him as possible, was blown from her anchorage

on May, 1915, and not released until she was carried right through the ice pack and into the open sea far to the north.

Nine men were left stranded on the mainland, but they carried on their work of depot laying, marching in all 950 miles out and home, though one member of the party, Mr. Spencer Smith, slowly collapsing with scurvy, had to be dragged on a sledge for forty-two days, only to die in the end; and all suffered terribly from scurvy and snow blindness. Fifteen hours a day the party toiled to cover three miles, but they got back and were in due time rescued.

Sir Ernest Shackleton made another voyage south in the Quest, setting out in September, 1921; but he had overstrained his heart, and died at sea in the attempt to undertake the labours of men whom he thought more fatigued than himself. His death occurred on January 5, 1922, and his body was buried in South Georgia, that little island just short of the Antarctic Circle, which had witnessed one of the most heroic of his many feats of knight-errantry and splendid resource.

THE NOBLE HEROISM INSPIRED BY THE LONG SEARCH FOR THE POLE

Over the South Pole float two flags, the Norwegian and the British, but, from Cook's day to Scott's and Shackleton's, the main glories and sacrifices were British. We suffered and sought, we found the route, and we followed it to the bitter end. A very gallant rival stepped in before us and has his shining place in our memories, while his rivals are for ever enshrined in our hearts. The Antarctic is a land of death and desolation, of horror and anguish, instead of being, as the ancients pictured it, one of smiling plenty and sweet repose.

It is not where they thought, it has not the people or the resources which they imagine; but it has inspired selfless heroism and ungrudging sacrifice of ease, health, happiness, and even of life itself.

It seems one of the impossibilities of the Earth, and for that reason it has challenged our noblest pride and will to honourable conquest. There are instincts in us all which are not to be conjured into action by gold and silver. These noblest of emotions have

great allies;

Their friends are exultations, agonies,
And love, and man's unconquerable mind.

The Poles are worthless in themselves, but they have been like guiding stars to some of the purest spirits the world has known.

The Great Stories of the World That Will Be Told for Ever



NEKUMONTA

THE Iroquois Indians were once stricken by a terrible plague. Day after day men shovelled away the snow and dug the freezing earth to make graves. Mourners were heard wailing from dawn to dusk.

Saddest of all was Nekumonta, a young brave who had lost his parents and all his brothers and sisters, and whose lovely wife Shanewis was now stricken down too.

"Husband," she whispered, "I must leave you. I see my dead friends part the curtains and beckon. But how can I rejoice in the lands of the blessed if you are left lonely on Earth?"

Nekumonta cried out: "I cannot live without you. The Great Spirit has planted the Earth with healing herbs, and I will find one which will cure you."

He laid a store of food and water near Shanewis, wrapped her in furs, and set out.

For three days and nights he wandered over hills and forests, but everywhere the snow lay thick, and not a leaf showed above the iron-like ground. Whenever the brave saw a rabbit, or bear, or elk, he cried to it:

"Oh, brother! Where shall I find a healing herb to cure my wife?"

The creatures hurried away in silence, but they understood, and pitied him.

Nekumonta never drew bow or threw spear as he searched. He forgot his own hunger in his anxiety. On the third night,

numbed and despairing, he fell asleep. The forest creatures drew near, and began to pray to the Great Spirit for Nekumonta.

Now, Indians think that the Great Spirit listens to the prayers of animals because their lives are innocent, and even those who kill only kill to satisfy hunger. So he sent Nekumonta a dream.

The brave heard voices singing: "Seek us, seek us, we can save Shanewis! Find us, find us, we are the Healing Waters!"

He awoke, and still he heard a fountain running. To and fro he ran, but no water could he find; the sound was loudest where he had slept. At last he guessed it came from a hidden spring. With trembling hands he dug through the snow till he came to thick ice. His axe broke it, and up sprang a jet of sparkling water.

Nekumonta lit a fire. Then he made a cup of clay, and baked it. Filling it with water, he prayed earnestly to the Great Spirit that he might not come too late.

When he reached the wigwam Shanewis had not the strength to speak. He forced the healing water between her lips, and saw light return to her eyes.

Then Nekumonta rushed out to tell his friends. They hastened to the stream, and all who drank the waters were cured.

Thenceforward Nekumonta had a new name—Chief of the Healing Waters.

BAULDOUR THE BEAUTIFUL

PECOPIN was handsome and Bauldour was beautiful, and they loved one another. Pecopin was the son of the Burgrave of Sonneck, and Bauldour was the daughter of the Lord of Falkenburg.

One owned the forest; the other owned the mountain. What could be better than to marry the mountain to the forest? The two fathers came to an understanding, and Bauldour was betrothed to Pecopin.

This happened in April, when the white-thorn flowered to the sunshine in the forest, and a thousand charming little waterfalls, made of snow and rain transformed into brooks, danced in music down the mountain. Pecopin had all the qualities of a brave and gentle knight; Bauldour was a queen in her castle, a humble and holy maiden at church, a fairy-like creature in the woods, and a good housekeeper.

It was said of her that her eyes were the sweetest ever seen. She spent most of her time at her spinning-wheel, and Pecopin went out all day hunting.

The day appointed for their marriage drew near. Pecopin became more joyful; Bauldour became more happy. Bauldour went on spinning in her room; Pecopin continued to hunt in the forest. As he was crossing a clearing a horn sounded, and a glittering troop of noblemen came out of the thicket. The great Count Palatine was among them.

"Come with us, you handsome young huntsman!" he cried.

"Where are you going?" said Pecopin.

"Young knight," replied the Count, "we are going to hunt a kite at Heinburg that destroys our pheasants; we are going to hunt a vulture at Vaugstberg that kills our young hawks; we are going to hunt an eagle at Rheinstein that slays our falcons. Come with us."

"With pleasure!" said Pecopin.

The hunt lasted three days. The first day Pecopin killed the kite; the second day he killed the vulture; the third day he killed the eagle. The Count was amazed at the feats of the young huntsman.

"Sir Pecopin," he said, "you shall have my estate of Rheineck. Come with me to receive it."

There was nothing to do but to obey. Pecopin sent to Bauldour a letter in which he sadly announced that the Count had compelled him to go. "But do not let this trouble you, my sweet lady," he added at the end of the letter, "I will be back next month."

The Count was so delighted with Pecopin that after a time he said to him: "I am sending an embassy to the King of France, and I have chosen you as my ambassador because of your knightly renown."

Pecopin went to Paris, and the French king was also pleased with him, and, taking him one morning by the hand, he said:

"I want some noble and well-spoken lord to take a message for me to Spain, and I have chosen you as my ambassador because of your great intelligence."

So Pecopin set out for Spain. At Granada the Moorish ruler received him very kindly, and when Pecopin went to say good-bye his host said:

"We must indeed say good-bye, my handsome young Christian knight, for you must start at once for Baghdad."

"For Baghdad!" cried Pecopin.

"Yes," said the Moor; "for I cannot sign the treaty with the King of France without the consent of the Caliph, the Commander of the Faithful. I must send some person of consideration, and I have chosen you as my ambassador because of your handsome face."

When you are among the Moors you must go where the Moors want you to go. So Pecopin went to Baghdad.

There he had an adventure. An old negress gave him a talisman in the shape of a magnificent turquoise, saying:

"This is sent by a princess who loves you, and whom you will never see. So long as you wear it you will remain young. When you are in danger of death touch it, and it will save you."

Now, this princess was the favourite daughter of the Caliph of Baghdad, and the Caliph was very angry that she should have fallen in love with a Christian knight.

Taking Pecopin by the hand, he led him to the top of a high tower, and said:

"Young knight, the Count sent you to the King of France because of your knightly renown; the King of France sent you to the ruler of Granada because of your great intelligence; the ruler of Granada sent you to the Caliph of Baghdad because of your handsome face; and I, because of your knightly renown and your great intelligence and your handsome face, send you to the grave!"

As he pronounced the last word the Caliph pushed Pecopin from the top of the high tower on which they were standing.

As Pecopin fell through space his last thought was of Bauldour. He put his

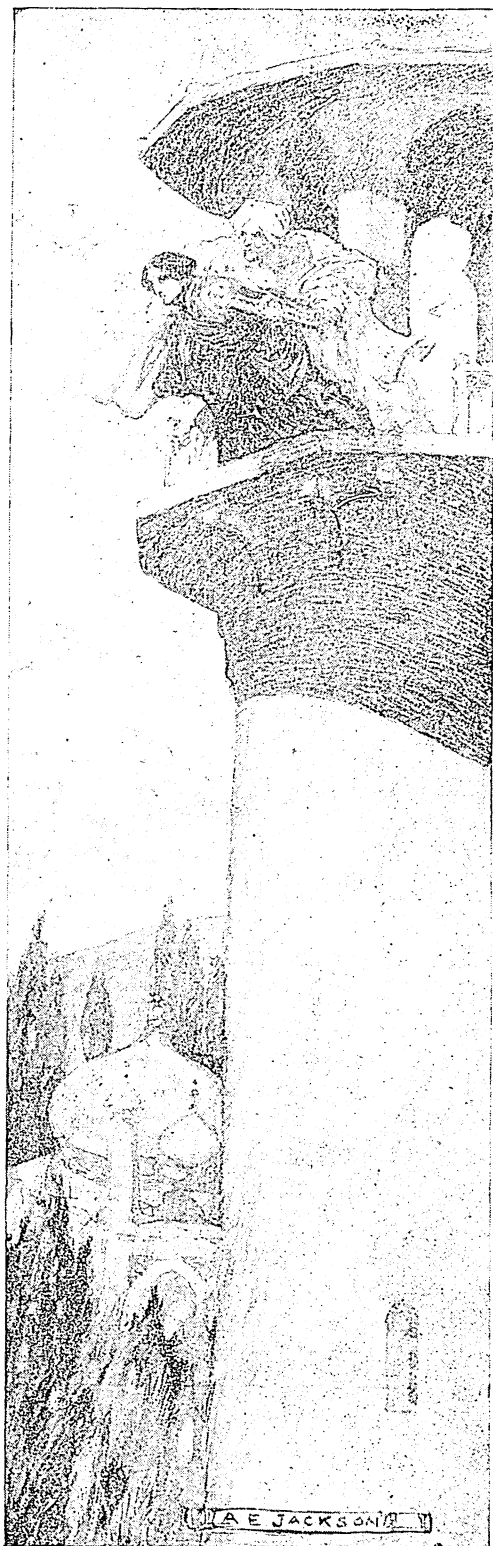
hand on his heart, and, without knowing it, he touched the talisman.

On touching the magic turquoise Pecopin felt as if he were being carried along by wings.

He no longer fell; he soared. He continued to fly all through the night, and at break of day the invisible hand which upheld him put him down on a lonely shore of the Arabian Sea.

For a long time Pecopin wandered about, vainly endeavouring to return to Falkenburg. Sometimes he went barefooted, sometimes he walked in sandals. He rode on the ass, the horse, the mule, the camel, the zebra, and the elephant. He voyaged in all kinds of boats, and encountered all sorts of winds. He was sold as a slave in one country, and made a king in another. Several times he was shipwrecked, but he always escaped, and never did he cease to yearn for home. Through all his adventures, achievements, and sufferings the brave and faithful Pecopin had only one aim—to return to Falkenburg; and only one hope—to marry Bauldour. Thanks to the talisman, which he always carried on him, he could neither grow old nor die.

At the end of five years, however, Pecopin was still seeking for Bauldour, and one day he found him-



AS HE SPOKE THE CALIPH PUSHED PECOPIN FROM THE TOP OF THE HIGH TOWER

self in the Forest of the Lost Tracks. No one who enters the Forest of the Lost Tracks ever finds a way out of it, and Pecopin, feeling that all was over, threw himself on the ground, crying: "I shall never see my beautiful Bauldour again!"

"Yes, you will!" said an unknown voice at his side.

Pecopin sprang up, and found himself face to face with an extraordinary old nobleman, clad in a magnificent hunting dress. He was thin and bent with extreme old age, but his manner was most gracious and pleasant.

"What do you want with me?" cried Pecopin, astonished.

"To take you to Bauldour," said the old huntsman, with a strange smile. "Spend this night hunting with me, and at break of day I will put you down by the gate of Falkenburg."

"But I am worn out with walking," said Pecopin. "I am dead with thirst and hunger. I could not even mount a horse."

"Drink this," said the old huntsman.

Scarcely had Pecopin drunk a mouthful when all his powers returned. He was again young, strong, and alert, and eager for adventure.

"Come on!" he exclaimed. "I will hunt all night with you if I can see Bauldour in the morning!"

"Hunt's up!" cried the old huntsman, turning toward the thicket.

A troop of knights, dressed like princes and mounted like kings, came out of the underwood and ranged themselves in a profound silence about the old huntsman. It was now quite dark, but the place was lighted up by two hundred grooms carrying two hundred torches. A vast pack of hounds of all kinds was led, yelping and straining at the leash, to the old huntsman, and two splendid horses.

"Take one," he said to Pecopin.

Pecopin mounted a superb steed; the old huntsman did the same. And away they all went like the wind.

Putting his hunting horn to his lips, the old huntsman blew a terrific blast that rolled out on the midnight air like thunder, and at the sound the forest was lighted up with thousands of extraordinary lights.

Then a great black mist fell upon everything, and Pecopin rocked and swayed along in the darkness in a strange, violent, and supernatural gallop that amazed and frightened him.

Now and then, when the mist lifted, he caught a glimpse of an enormous stag with sixteen antlers fleeing in front of the wild huntsmen. Then he saw in the distance the broad, moonlit sea. He tried to stop his horse, but it would not stop; he tried to throw himself out of the saddle, but, on making a movement to dismount, his feet were gripped as with iron bands. He looked down, and saw that his stirrups had become living things, grasping him tightly and holding him in his saddle.

The wind became hot and stifling. Pecopin gazed round, and saw that he was galloping through India. A quarter of an hour afterwards he was chilled to the bone. The air was thick with snow, and the hard, frozen ground rang with the sound of the innumerable hoofs of the horses. And all the time, louder and deeper and higher than every other noise, rang the wild, mad thunder of the horn of the strange old huntsman.

ONLY ONE THING TO DO

THE greatest height human nature can reach is in laying down life for others, and in that heroic spirit there passed from this world Commander Douglas, Conservator of the Port of Madras.

When sailing in the harbour of that port with a friend, his yacht overturned in a squall, and the commander, turning

Suddenly Pecopin's horse stopped and all the sounds around him ceased. He found himself alone at the open gate to a colossal building.

While he was wondering what to do his horse leaped through the gate and carried him into an immense hall. Here the old huntsman and his companions were sitting round a great table, on which, in an enormous dish, was the stag with sixteen antlers, roasted and smoking.

"Now you must sup with us, Pecopin, after our great hunt," said the huntsman.

But as he spoke a cold white gleam of daylight came through the eastern windows and a cock crowed, and Pecopin fell from his horse to the ground. When he got up he found himself alone by the gate of an old castle. He looked at it, and shouted with joy. It was the Castle of Falkenburg! In the twinkling of an eye Pecopin reached the fifth storey of the castle, where Bauldour used to sit, and he heard the sound of her spinning-wheel through the closed door. But on entering the room he found there only a poor, wrinkled, withered little figure, crouching by the window, her eyes bent over a spinning-wheel.

"Where is Bauldour, my beautiful Bauldour?" said Pecopin to her, "Bauldour, with eyes the sweetest ever seen. I have come back at last to marry her!"

The strange little withered figure tottered across the room, and with a faint cry threw herself on Pecopin's breast. It was Bauldour. She was 120 years old!

The night which Pecopin had spent hunting with the wild huntsmen had lasted a hundred years, but owing to the magic talisman Pecopin himself was still as young and handsome as ever.

What should he do now? He still loved Bauldour, but he could not make her younger. At last he threw away the talisman; and then, ageing a hundred years in a single minute, he came back to his sweet lady and married her. And they lived together happily at Falkenburg.

to his companion, who, with two natives and himself, clung to the upturned boat, said: "Look here, old chap, this boat will not support us all, and you're a married man. There is only one thing for it." And he dropped off.

All the others were rescued, but the commander could not be found.

THE VOYAGE OF MAELDUNE

ONE day young Maeldune, the queen's foster-son, was playing near the ruins of Doo cloone Church.

Presently a monk came up to the group of youths, and, gazing at Maeldune, said: "It were better to avenge the man who died here than to shoot arrows or hurl stones over the place."

"Who died here?" asked Maeldune.

"Ailill, your father," replied the monk, and stalked away.

Maeldune left his companions, and went home. To his foster-mother he said:

"I beseech you tell me now what you have never told me before. Who are my parents? For a stranger has told me today that I was playing where my father died."

The queen at first tried to silence him by saying, "I am your father and your mother; be at peace," but at last he urged her till she replied:

"Your mother, who was my dearest friend, is now a holy nun, and you will never see her face. Your father was a famous warrior called Ailill Edge of Battle. He perished before you were born: raiders came from Leix, and burned the Church of Doo cloone over his head."

At these terrible tidings Maeldune was bowed down with grief. But presently he told his foster-mother that he must avenge his father's death, and he went to the Druids for counsel.

They told him that he must take only seventeen warriors with him; they told him on what day he must put to sea; they instructed him how to build a coracle of skins stretched over wicker, and how to find his way.

When Maeldune finally set sail he had with him seventeen of the noblest young warriors in Ireland. Suddenly they heard a sound of shouting and saw Maeldune's three foster-brothers standing on the beach. Maeldune called to them to go home: he did not wish the queen to lose all her children, and he did not wish to disobey those wise men the Druids. But his foster-brothers plunged into the waters, and swam after the boat till Maeldune feared they would drown, and let them come on board.

Before long they arrived at the island where the man lived who had led the raid against Ailill. But just as they were about to run ashore a furious blast blew off the land and drove them out to sea, and when at last the storm abated they did not know where they were.

"This is because you forced me to disobey the Druids," said Maeldune; and his foster-brothers hung their heads.

For a long time they wandered up and down the seas, seeing strange sights, and meeting many perils, without ever hearing tidings of Ireland. They came to thirty-three islands in the course of their voyage, and it would take a book to tell the whole story of them.

On one isle they saw ants as big as foals running along the shore; on another they saw fiery swine running along the earth, which was charred by their feet; on another they found hoof-marks as large as a ship. They came to one which was quite deserted; but there was a house there, with a feast prepared, and the walls hung with armour and rich jewellery. When Maeldune entered he saw a little cat leaping and playing by itself, so he asked it: "Is it lawful for us to take this food?"

It looked at him, and went on playing.

The hungry warriors sat down, and ate and drank very thankfully. But when they rose to go one of the foster-brothers took a necklace from the wall, in spite of all Maeldune could say. Then suddenly the little cat sprang right through him, and instead of a warrior there was only a little heap of ashes on the floor.

They sailed away till they came to the Isle of Flowers, whose breath met them out at sea. Here was never a tree or pebble or beast; from hilltop to shore the land "swept like a torrent of gems from the sky to the blue of the sea."

And the red passion flower to the cliffs, and the dark blue clematis, clung,
And, starred with a million blossom, the long convolvulus hung
And the topmost spire of the mountain was lilies in lieu of snow,
And the lilies like glaciers winded down running out below

The loveliness intoxicated the travellers; they "rolled upon capes of crocus," and sang songs. But alas! they could not eat flowers, and had to sail on.

They came to an island whereon there was nothing save two stone towers, which butted at one another like bulls; and to an island of silence, where seas and waterfalls made no sound, and when the warriors tried to shout there came but a mouse-squeak, even from men "that could raise such a battle-cry that a hundred who heard it would rush on a thousand lances and die."

They came to an island where black men sat mourning and lamenting. One of the foster-brothers went ashore, and instantly turned black and began to mourn like the islanders. He paid no heed to his companions' shouts, and when some went to rescue him they, too, fell under the spell.

There was another island, which seemed to be deserted, but as they went inland they came upon a huge mill at which a giant was grinding. He looked at them with a grim, evil smile, and said :

"Here is ground all that men begrudge each other ! Much of my grain goes into your country."

They hastened away, ashamed. Presently they came to a land on which there stood a fortress with a brazen door and a bridge of glass. Every time they tried to cross it the bridge hurled them back. At last one warrior, more nimble than the rest, reached the brazen door, and struck on it. The metal gave out a melodious note, and sudden sleep fell on the voyagers.

Three times this happened, but on the fourth day a fair damsel opened the door, and gave them food and soft couches. At daybreak they found themselves at sea, and no trace was left of the island.

By and by the sea beneath them became as clear as air, and they saw towers and gardens and people keeping their flocks in lands of heavenly beauty under the sea. Then three of Maeldune's best men "plunged headlong down in the sea, and the Paradise trembled away."

The waters grew dark again, and before long they sighted another island. Many people sat on the beach laughing. One of the foster-brothers went ashore to learn the cause of their merriment, but no

sooner did his foot touch land than he began to laugh with the rest, fallen under an enchantment like his brother.

At last they came to a rocky, barren land on which there lived an old hermit. Maeldune asked how he managed to live, and how he had come there. The old man replied that he had been a monk, and had stolen the monastery treasures, which he put in a boat and rowed away. By and by he saw an angel sitting on a wave. The angel cried to him :

"Sad will be your voyage ! The air about your sail is thick with demons. Your boat cannot stir."

The monk confessed his sin, and was bidden to throw his ill-gotten treasure into the sea. He said, "It is a pity that it should profit no one." The angel replied, "The deed shall profit thee."

Then the angel vanished, and the man's boat moved on of its own accord till it came to this naked isle, where he landed, and fell on his knees in prayer. When he opened his eyes others were before him, some carrying fish, and some burning brands to cook it with ; and thus he had been nourished ever since.

Long years of lonely meditation had made him wise and holy, and because Maeldune saw this he asked counsel of him. Then the hermit bade him forgive his enemy if he hoped God would forgive his own sins. Once more Maeldune set sail.

Shortly afterwards they saw a falcon, such as they had seen in their own country, so they followed it, and it led them home.

When Maeldune's enemy heard of their return he was filled with terror ; but Maeldune set aside vengeance, as the hermit had bidden him, and went home to comfort his foster-mother.

FATHER AND SON

IN the turbulent days that followed the death of Julius Caesar in Rome Quintus, the brother of Cicero, was sentenced to die, and he hid in a secret place in his house.

As they could not find him the enraged soldiers seized his son, and tortured him in the vain hope of compelling him to reveal his father's hiding-place. Not a word would the son speak.

At last a groan escaped the suffering youth and reached the father's ears, and Quintus, unable to endure the sound of his boy's sufferings, burst from his hiding-place and surrendered, begging the sol-

diers, with tears in his eyes, to spare his innocent boy.

But such a thing as pity was unknown to these murderers, and they only mocked at the father's prayers and the son's pain. They must both die.

The unhappy pair accepted their fate with gallant resignation, but now disputed as to who should suffer first, each desiring to be the earlier victim. The assassins, however, settled the matter by killing father and son at the same time.

Few more pathetic and inspiring instances of the mutual devotion of father and son are to be found in history.

LE RENARD ET LE CHEVAL FIDÈLE

This is a French translation of the story told in English on page 2268

UN fermier avait un cheval qui l'avait servi fidèlement, mais qui était devenu trop vieux pour travailler; alors le fermier refusa de lui donner à manger et dit: "Je n'ai plus besoin de toi; sors de mon écurie. Je ne te reprendrai à mon service que lorsque tu seras devenu plus fort qu'un lion." Puis il ouvrit la porte et chassa le cheval.

Le pauvre animal était fort triste; il se promena de long en large dans le bois, cherchant un abri contre le vent glacial et la pluie. Bientôt un renard le rencontra.

"Qu'y a-t-il, ami?" lui demanda le renard. "Pourquoi cette tête baissée, et cet air de solitude et de tristesse?"

"Ah!" répondit le cheval, "mon maître a oublié tout ce que j'ai fait pour lui pendant tant d'années, et, parce que je ne suis plus en état de travailler, il m'a chassé et m'a déclaré qu'il ne me reprendrait pas à moins que je ne devinsse plus fort qu'un lion."

Cependant le renard lui dit de reprendre courage:

"Je m'en vais t'aider. Couche-toi là; étends-toi en te raidissant, et fais le mort."

Le cheval obéit, et le renard se rendit tout droit chez le lion qui habitait une caverne voisine, et lui dit: "Tout près

d'ici se trouve un cheval mort. Viens avec moi, sa carcasse te fournira un excellent repas."

Le lion fut enchanté, et se mit en route aussitôt: lorsqu'ils parvinrent aux côtés du cheval, le renard dit:

"Tu ne pourras pas le manger à ton aise ici. Écoute donc: je m'en vais t'atteler solidement à sa queue, et tu pourras le traîner à ton antre et le manger à ta convenance."

Ce conseil plut au lion, qui se coucha pour permettre au renard de l'atteler au cheval. Mais le renard réussit à lui lier les pattes ensemble, si solidement que, malgré toute sa force, il ne parvint pas à se libérer. Ce travail terminé, le renard donna une claque à l'épaule du cheval, en lui criant: "Hue, Cocotte!"

Le cheval se releva d'un bond, et s'élança en avant, traînant le lion derrière lui. La bête se mit à rugir, à beugler, si bien que tous les oiseaux de la forêt s'envolèrent terrifiés; mais le cheval le laissa rugir, et se dirigea vers la maison de son maître.

"Le voici, maître," dit-il. "Je l'ai vaincu." Et quand le fermier vit son vieux serviteur, son cœur s'attendrit, et il lui dit: "Tu resteras à l'écurie, et l'on te soignera."

HOW THE CHILDREN SAVED THE TOWN

THE little town of Spinalunza, in Italy, was built on a long ridge of rock surrounded on three sides by a deep ravine, so that an enemy could attack it only from the west. On the hilltop stood the cathedral, with its great square, where the children played in the midst of orange trees and pomegranates.

Long ago, in the autumn, a fierce captain, with 800 horses and 2000 men, knocked at the gates of Spinalunza, demanding admission in the name of Pisa. The war bell was rung, and the people ran to defend the walls. In the morning the captain shouted from outside: "We are from Pisa; Florence is attacking us, and we must hold this town for our safety. All we ask is a pledge that you will not join Florence against us."

"What pledge do you ask?"

"Let twenty of your children ride back with us to Pisa; we promise that they shall be well cared for."

A messenger was sent out to the captain to say: "Tomorrow the gates will be

thrown open, and the children will come out for you to choose twenty."

The enemy spent the night in drinking; the children slept while their parents prayed. An hour after midnight the garrison met in the square, and were divided into two bands. These were ordered to descend into the ravine on the eastern side of the town, and make their separate ways until they had the enemy between them.

At daybreak the bells began to ring, the gates were thrown open, and the children trooped out, singing and holding a cross aloft. The townspeople wondered as they saw behind each child an angel with a fiery spear. As the singing children swept through the gates panic seized upon the foe. Their horsemen fled, plunging in terror through the ranks of the footmen; and in this scene of confusion the townsmen, waiting in the woods, rushed down and put the enemy to rout.

So the children saved the town, and if you go to Spinalunza you will still see children playing in the cathedral square.

UNDINE OF THE LAKE

ONCE upon a time there lived in Germany an old fisherman and his wife, who had one little daughter.

The part of the lake country in which they lived was so wild and desolate, and there were so many stories about the woods and rocks and rivers being enchanted, that at last, for the sake of their little daughter, they determined to move away. But on that very evening the fisherman was met by his pale and trembling wife with the news that their daughter had fallen into the lake and had been washed away.

How great was their sorrow! How terrible their loss! Their one possession was taken away; the one hope in their lives vanished. These old people, who worked so hard and lived so far away from other people, had nothing left to make life bright and joyous.

A storm arose as they sat mourning in their cottage: the walls shook, the doors rattled and creaked, and the windows were lashed by rain. As the old couple sat with bowed heads in front of the fire, grieving for their lost child and listening to the tempest, suddenly there came a faint cry from outside, and a hand seemed to be fumbling at the door.

The fisherman got up and crossed the room, thinking that a sailor or a traveller had come for shelter to his cottage. But when he opened the door, instead of a pale and frightened man, a girl of surpassing loveliness, all wet and streaming from the storm, and yet bright with joy and pleasure, stepped quickly into the room and ran laughing to the fire.

The old people were amazed at the sight of their visitor, and could hardly speak for astonishment. And when they did find their voices, and began to question the pretty girl, it was only to be filled with still greater astonishment. For she could tell them nothing of her parents, nor of the place from which she had come; and only repeated again and again the statement that she had fallen into the lake and that her name was Undine.

It seemed as if Providence had sent this strange visitor to take the place of the little drowned girl, and so the fisherman and his wife made her welcome.

But though they loved her dearly, and made many sacrifices for her happiness, she was often a very great anxiety to the old couple. For whenever the wind blew and the rain fell, whenever the lightning

flashed and the thunder roared, whenever the streams were in torrent and the waves of the lake rose in great mountainous masses, little Undine would open the latch of the cottage door and run out into the midst of the storm, clapping her hands and singing with delight, saying that she loved these things more than sewing and dusting and cooking.

Sometimes she was unkind to the fisherman's wife, and sometimes she vexed the old fisherman sorely. But she was never sullen or black-tempered. It was her waywardness of disposition that caused her to grieve her foster-parents.

Undine was growing into a lovely maiden when there came to the fisherman's cottage a handsome knight who had lost his way in the forest.

His name was Hildebrand, and he had taken part in a tournament, where a proud lady named Bertha had treated him badly. He was gloomy and sad, feeling that his love for Bertha was hopeless, and wondering how so beautiful a lady could have treated him so ill. But, though he was so sad, Undine thought she had never seen anything on Earth so beautiful as this young knight.

She sat on a stool at his feet, gazing up into his face and listening to his voice. Then she took his hand, and held it and kissed it. He was the one thing greater and more beautiful to her than the tempest and the voice of the waters.

The knight was amazed at the strange maiden. He questioned the fisherman about her and heard the story. "She is probably a nobleman's daughter," he thought. Undine talked to him about the winds and the clouds, the rain and the storm, and took him to visit many places of great beauty.

She took him into the enchanted forest, and, mounted on his own horse, showed him wonderful and magic things. The more the knight spoke to her, the more he felt the wonder and charm of this wild maiden. At last he proposed to marry her.

And now the true story of Undine must be told. When the fisherman's daughter fell into the lake the fairies decided to give the old couple another daughter, and Undine was sent to them. She was a water-nymph, and, like all other creatures of that kind, possessed no soul. Her father wanted her to have a soul, and so he sent her to become a human being.

UNDINE OF THE LAKE

When the priest came to marry Undine he was surprised by her wild ways, and spoke seriously to her about the soul. At first she only laughed; but after hearing the prayers of the priest she said:

"There must be something beautiful, but, at the same time, extremely awful, about a soul. Tell me, holy sir, were it not very much better that we should never receive such a wondrous gift?"

The beautiful maiden who loved Nature felt that to possess a soul meant something dreadful in her life. It was a great gain, but it entailed a terrible loss. She would

journeying with her husband and her foster-parents to Hildebrand's castle they stayed at the castle of another great lord, whose adopted daughter was the proud Bertha once loved by Hildebrand. It was revealed to Undine that this Bertha was the daughter of the fisherman and his wife who had fallen into the water. One day she sang a beautiful song about Bertha's real parents, and Bertha was so moved by it that she wept.

"Oh, Undine," she exclaimed, "show me my parents, that I may go and love them!" But when Undine said gently,



UNDINE SHOWED THE KNIGHT MANY MAGIC THINGS IN THE ENCHANTED FOREST

become immortal, but first she would have to taste the cup of human grief and mortal pain. Nevertheless, so great was her love for Hildebrand that she knelt meekly before the priest, and in prayer became a human being.

Her nature seemed to change at once. She became grateful to her foster-parents. A great and inexpressible tenderness took the place of her old wilfulness. She was loving and helpful. She showed her husband the depth of a nature to which love was all in all.

For some little while Undine was supremely happy. But as she was

"Dearest Bertha, these are your parents," the proud damsel vowed that she could not possibly be the daughter of a fisherman. But marks on her shoulder and foot proved that she was the fisherman's daughter, and she burst into angry tears, being ashamed of her poor parents.

Undine was sorry for the proud girl, and persuaded Hildebrand to invite her to their castle. When they arrived there Bertha set herself to revive Hildebrand's love, and presently made the husband cruel to his wife. Poor Undine warned him that something dreadful would happen if he spoke cruel words to her.

But Bertha was always making Hildebrand more and more angry with Undine. At last one day, as they were sailing on the Danube, Hildebrand spoke more angrily than ever to his wife.

"Alas, sweet friend," she exclaimed, "alas, farewell," and vanished over the side of the vessel.

All the waves began to cry out: "Oh, woe, woe! Oh, remain true! Oh, woe!"

Some time after the disappearance of Undine Hildebrand married Bertha. But the wedding ceremony was one of the deepest gloom. Hildebrand retired early to his room. As he stood before a mirror he heard a tap at his door which reminded him of Undine's entrance. Then he heard

a voice. Then in the mirror he saw the door opening very slowly, and a white figure glided into the room. He dared not look at the figure except in the glass.

"You must die," said a voice.

"Do not make me mad with terror!" cried Hildebrand. "If you wear a hideous face behind that veil do not raise it; take my life, but do not let me see you." But the veil was lifted, and he saw the exquisite face of Undine. Then he swooned in her arms, and, while she kissed him, he wept away his soul.

From near the grave where Hildebrand was laid a little silver spring gushed forth, and people say that it is Undine, who still holds her husband in her loving arms.

THE HEROINE OF THE STORM

HANNAH ROSBOTHAM was a teacher in the National School at Sutton, in Lancashire, in the autumn of the year 1881, when a terrible gale burst over England, leaving a track of destruction and death to mark its path.

Nowhere was the fury of the storm more severely felt than in Lancashire, and the little village of Sutton suffered severely. On October 14 Miss Rosbotham was in charge of the infant school. The ordinary difficulties of her duties that day were not lessened by the storm. It was no easy task to keep the children to their lessons in face of the terrific gusts which now and then shook the building to its foundations.

About eleven o'clock all were startled by an unusual rumbling noise overhead, followed by a tremendous crash. An instant of silence followed, broken at once by the shrieks of the terrified children, as they made a wild rush to the playground.

A portion of the stone belfry, weighing nearly a ton, had fallen through the roof, a distance of nearly thirty feet, burying the gallery in its ruins. The school was thrown into a state of great alarm. All who could hurried from the place, for there was no telling when the remainder of the masonry might come down.

Hannah Rosbotham alone did not share the general panic. She remembered the little ones in the gallery, and hurried toward the place. The ruins of the fallen belfry littered the steps, and the air was thick with choking dust. The last remnants of the shattered masonry were still falling as she made her way upward, her face white and set, her courage undaunted. If fear had any place in her thoughts it

was not for herself, but for the little ones who were in her charge. Reckless almost in her eagerness, she rushed into the room, to find the children sitting in their places, motionless with terror.

The sight of their teacher broke the awful spell, and they flocked round her, eager to know what had happened. Without loss of time she led them downstairs and into safety. Then it was found that all had not escaped. Six or seven of the little folk were missing, and there could be no doubt that they lay buried in the ruins. To return was the action of a moment, and almost directly she saw two of the children lying under a heap of slates and timber. Their faces alone were visible.

Quickly kneeling down beside them, the teacher set to work to remove the weight that pinned them down. With frantic energy she toiled, alone and unaided, amid the shriek of the wind and the crash of the storm, which threatened to bring down the remainder of the tower at any moment. Even as it was, slates and loose stones fell around her as she tore away the ruins.

One by one the children were set free, and made their escape down the staircase. Still she toiled on, extricating one after another, till all seemed to have been rescued. Then, half carrying, half dragging the last two, she made her way to the door. Here she was met by the headmaster, who had hurried to her aid.

And so it came to pass that Miss Rosbotham found herself everywhere proclaimed as a heroine, and a few months later she received the first Albert Medal ever awarded to a woman.

THE RICH VILLAIN

A LONG time ago there lived a villain whose wealth was known all over the countryside.

No manor equalled his in beauty, no gardens were more luxurious, no orchards grew better fruit. A river well stocked with fish ran through his woods; it seemed that there were not enough names for all the plants and trees flourishing on his large estate. Yet all this seemed quite natural to the neighbouring folks, for it was thought that the place was enchanted.

He had no needs, for all his wishes were granted. But happiness he could not find. The more he had the more he wanted.

One day a lovely bird caught his attention. He was hardly bigger than a wren, as quick as a swallow, tame as a robin. His colouring included all the colours of the rainbow. But his song was the best part of him; no nightingale surpassed it.

"Suppose I could catch that bird," thought the villain, "who would not give a good price for such a rarity?"

And that very evening the little bird was caught in a trap.

"You used to sing for your own pleasure, but now you will have to sing for other people's," said the man.

But to his amazement the bird answered.

"So this is how you would repay me for my song!" he replied. "But you will not gain much from it, for my ransom shall be a small one. How can you expect me to sing, a prisoner in a cage?"

"I will eat you if you refuse."

"A poor meal indeed, for I am tiny and thin," said the bird. "Believe me, the sin you commit is not worth so little profit. Do let me go!"

"You are talking in vain," said the man. "The more you entreat me the less I shall feel inclined to release you."

"Well," retorted the bird, "hear me. If you set me free I will teach you three maxims that nobody knows, and out of which you might derive great profit."

The word profit sounded like magic to the greedy landowner.

"If I were sure that I could trust you you should be free on the spot," he said.

"I promise I will not deceive you," said the bird.

The man opened his hand wide. The bird flew straight to his tree. He looked strange indeed with his feathers ruffled, and he began pluming himself busily.

But the other had already built great hopes on the promised maxims, and he

longed to hear them. Restlessly he waited, and at last this is what he was told:

"Now, listen, rogue. This is the first of the three maxims I have promised you: Never believe all you are told."

The villain puckered his brows.

"There is nothing new in this," he said.

"Well, try not to forget it, anyhow."

"Ah, you rascal!" cried the landowner. "If I could catch you again you would never get another chance to make fun of me!"

"Listen to the second maxim," said the bird. "Do not regret what you have never really had."

"Now I know that you are a storyteller!"

"Shall I repeat these two maxims again lest you forget them?" continued the bird, as though he had not heard.

"I know them better than you do," replied the man. "Do you take me for a fool? What is the third maxim?"

"Be very attentive," answered the bird, "for whoever knows it will never be poor."

The man listened eagerly.

"Never throw down at your feet what you hold in your hand."

At this the man became wild with rage.

"Why did I ever trust that stupid fledgling?" he cried. "None of these maxims is new to me."

"On my faith," retorted the bird, "the third one was, for had you known it you would never have let me escape. They say," he added maliciously, "that my body holds a precious stone weighing some three ounces, and that whoever owns it will have nothing more to wish for."

On hearing this the villain nearly went out of his mind.

"Stupid wretch!" said the bird. "When you held me in your hand did you not notice that I was smaller than a tit, which does not weigh half an ounce?"

"No, I did not."

"Then don't you see that I am making fun of you? Have you not just been regretting the stone you never had? And did you not throw me away when you held me in your hand? Now, listen to something more: It is in vain that a foolish man hears sensible words, and, truly, when he is foolishness itself he thinks himself the wisest."

After which the bird flew off, never to return. But the leaves fell down from the trees, the orchard withered away, and the river dried up for ever.

THE SLAVE BOY OF LAHORE

This is one of the tales they tell in India of the very long ago.

IN the reign of Sultan Mahmud Ghaznavi of Ghazni a son was born to an Indian farmer. His parents were so poor that they had to sell him into slavery as soon as he grew old enough to work. Being an intelligent and good-looking boy, Melik Khas soon became the favourite of his master the Sultan.

All the courtiers were very jealous of him, and they waited for an opportunity to disgrace him. It happened that the slave boy fell asleep one day in his master's presence. This incident was quite insignificant in itself, but the courtiers saw in it an offence to the imperial majesty, and they tried to persuade the Sultan to dismiss such a useless slave. Their royal master took no notice of all their insinuations, but his love for his favourite grew daily.

One of the courtiers found that Melik Khas went secretly every day to a wooden hut, which he always kept locked. He suspected him of worshipping a hidden idol. The rumour spread through the Court. It was suggested to the Sultan that he should pay a surprise visit to the house of Melik Khas, and ask to be shown the hut.

The Sultan agreed. Melik Khas was very happy to see his master coming into his house. While he was showing him round the royal visitor saw the little wooden hut, and expressed the wish to enter it. Melik Khas hesitated for a while, but, seeing the scornful smiles of the

courtiers, he opened the door, and there lay a villager's shirt and scythe. The Sultan looked at his slave in astonishment.

"Sire," said Melik Khas, "I put on this shirt and take this scythe in my hand every morning and evening, to remind me of my humble origin."

The Sultan was so moved with his humility that he raised him to the dignity of an Omrah.

Melik Khas soon distinguished himself as a soldier. He plundered many Hindu temples in order to give the booty to his master. People used to call him "the destroyer of idols," and the Sultan rewarded him with many riches. But Melik Khas remained unspoiled. With the money he got he built a mosque, which he called Allah Nur—the Glory of God.

Once again his enemies started a rumour, this time that the Sultan's favourite wanted to seize the throne. The Sultan summoned him to his presence to find out the truth, but the young man only sent a message saying that he was engaged and unable to see his master. This was held as a proof against him, and, following his courtiers' advice, Mahmud Ghaznavi led his army against Melik Khas. In the battle the Sultan's army was beaten and the Sultan himself taken prisoner. Melik Khas marched in triumph to the palace, where he set his master once more on the throne and prostrated himself at his feet.

The Sultan was so touched by his devotion that he gave him the city of Lahore.

HOLBROOK OF THE DARDANELLES

IN 1915 the Government of New South Wales were busy removing German names from their map; and one of the new names put on was the name of Lieutenant Holbrook, a lieutenant in command of a British submarine.

The Dardanelles is a strait out of which flow the waters of the spacious Black Sea and the small Sea of Marmora, and the strait was so thickly flanked by powerful batteries that no large ship of war could live within their zone of fire.

Also the whole channel, which in parts was but a fairly strong swimmer's distance across, was studded below water with deadly mines. Inside the strait, in the Sea of Marmora, the Turkish fleet could shelter, safe, as they thought, from the British, who commanded the outer waters.

But that sense of safety proved delusive. Lieutenant Holbrook, in his submarine, nosed his way under the current, feeling for

an open pathway. Five rows of mines guarded that blind, under-water pathway. But under each of them Holbrook worked his fearless course, and at last emerged safely in the Sea of Marmora.

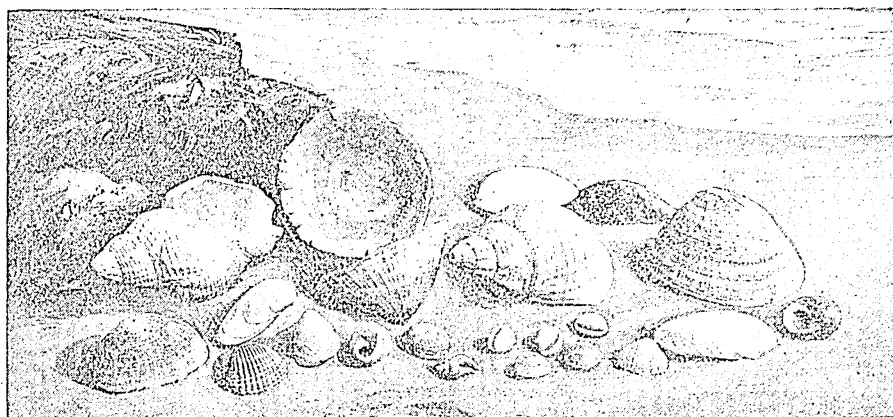
Then, rising to the light of day, he made known his feat to the terrified Turks by torpedoing one of their battleships lying at ease off the Bosphorus, the waterway to Constantinople.

Consternation shook the hearts of the people of the Turkish capital. What would not those English do if they could pass the defences of the Dardanelles, which everyone had deemed to be impenetrable?

Not only did the brave Holbrook harry the Turkish warships out of the Sea of Marmora, but he brought his submarine safely back through the deadly channel.

Can we wonder that the Australians preserve his name as that of a North Sea comrade of their own gallant sons?

Nature's Wonderful Living Family in Earth and Air and Sea



Shells of the seashore

THE GREAT MOLLUSC FAMILY

THERE is Roman blood in British veins. Britain was for about five centuries a Roman province, and a shellfish was largely responsible. Bivalves, rather than Britons, brought Julius Caesar to our shores.

The grave reasons for the Roman invasion we may find in Caesar's own writings, but when we turn to the later Roman writer Suetonius we learn that Caesar yearned for the pearls Great Britain was reputed to possess, and that he came here hoping to get them.

They may have sufficed to turn the scale. We know that the only article of spoil Caesar is recorded to have carried home from Britain was a breastplate adorned with pearls, and this he dedicated in the Temple of Victory in Rome.

So that shellfish had an important part in the story of the times which brought us out of the bondage of barbarism. They were food and implements to our ancestors in still earlier times ; and all over the world today, where civilisation has grown old, they are the raw material of history.

Wherever we examine prehistoric sites great mounts are found, formed of the débris of old-time kitchens. There are the bones of the animals the people ate, and among them the shells of shellfish. Even in the absence of bones and implements,

these old shells in a rubbish mound tell of ancient men and ancient meals, wordless annals where other records are missing.

There are shellfish as near to the North and South Poles as water can go. There are shellfish in the tropics. There are shellfish round the shores of every desert island where seamen have been wrecked, food like manna in the wilderness to these unhappy souls.

The shells of shellfish, with their contents extracted, are money in various parts of the world ; they are personal ornaments in many lands ; emblems of sovereignty in some, part of religious regalia elsewhere.

Yet we do wrong to use the word shellfish, for there is no such thing as a shellfish. The creatures living in shells are not fish. Crabs and lobsters are Crustaceans ; oysters, mussels, whelks, snails, slugs, octopuses, and the giant squids, are Molluscs.

There is another of Nature's apparent miracles in the shell of a mollusc. It grew out of the soft body of a sluggish, defenceless creature dwelling in the sea, and became, in course of ages, a marvel of beauty and defence. In general a shell is composed of three layers. The outer is a horny substance ; the middle consists of prisms of limy substance, and the inner is

PREHISTORIC LIFE · MAMMALS · BIRDS · REPTILES · FISHES · INSECTS

a lining of alternating films of different kinds forming a series of microscopic ridges which break up light as a prism does, so producing the beautiful rainbow effects seen in pearl.

The animals came first, the shell long afterwards, necessitated by the rise of rapacious creatures which, turning from a vegetable to a flesh diet, ate the soft-bodied molluscs as we eat ripe fruit. The plants bearing fruit put on spines and prickles as an armour; the soft-bodied animals put on shells, not suddenly, of course, but evolving them through great periods of time; not consciously or by deliberate effort, but little by little, without individual knowledge or design.

The chitin of the insects, the sting and wax of the bee, the fangs, virus, and mail of the serpent, the silica which makes a corn-stalk relatively stronger than the sturdiest factory chimney Man can build; the prickles of the porcupine and of the sea urchin, the silk of the spider and the caterpillar, the cruel talons and riving beak of the eagle and the vulture, are all slowly evolved gifts from Nature's inexhaustible storehouse of ideas translated into material form. Shells for molluscs are merely another item in the astounding catalogue of aids to existence which Nature has furnished for her children.

THE MYSTERY OF THE ORIGIN OF THE MOLLUSCS

We cannot say from what type of creatures the molluscs arose. In many of the living classes which we have studied, we have been able to follow links of relationship and see from what stem our animal derived, and to what collateral offshoots they gave rise. We cannot do that with the molluscs. At some time in the great creative past the power was placed at the disposal of the mollusc to pour out, from that fleshy part of its body called the mantle, a fluid which hardens into the substances forming the shell. The water animals obtained their supplies from lime contained in the sea and fresh pools; the land animals won their material from mineral matter taken up by plants from the soil.

So armour became the right and possession of one of the humblest orders of life. The plan prospered amazingly. It made the world safe for this lowly democracy in a thousand directions. Heavy shells came to be homes for animals exposed to perils not only from enemies

which hunt by the shore and the shallow depths of the sea, but against the turbulence of the sea itself, which breaks like thunder on cliff and rock and shingle.

We find that molluscs exposed to this kind of violence are defended by massive shells, but that molluscs which take the broad highways and steep depths of the sea, have thinner, lighter shells, as have the animals in our still ponds and streams, and those which move by stealth about the land, subsisting on vegetation.

ENGLISH SNAILS OF LONG AGO WHICH WERE MORE THAN SIX FEET LONG

So a huge class of animals had their housing problem permanently solved for them; each was born to carry its house on its back. The process meant a slow but sure progress through life; and, as we see, certain types reduced their burden of security, so that the shells of slugs, cuttles, and the rest no longer appear, but have vanished like the limbs of the snake and the hind legs of the whale.

Ancient sunny seas had mollusc forms as big as cart-wheels with huge sucker mouths; even England produced snails six or seven feet long. The revelation of these old-time monsters we owe to Mr. H. L. Tucker, who during excavations between Hastings and St. Leonards in 1922 found remains of these extraordinary snails and sent them to South Kensington.

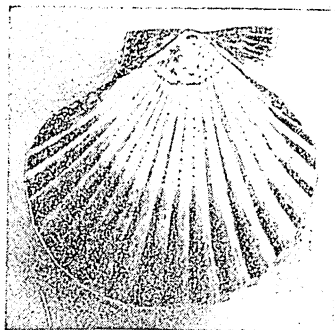
They were found to belong to an era some 80 million years ago, and were marvels of natural contrivance, not like modern snails in shape, but long and straight with spirals running round them for the whole of their length. The spirals were 60 feet long when followed throughout their windings.

The giants among molluscs passed away, and the molluscs of today fall into three groups. There are those whose shells have been reduced to vestiges, those whose shells are single, and those whose shells are double. The two-shelled, as in the oyster and mussel, are called *bivalves*: the one-shelled are called *univalves*.

A GROUP OF QUAIN CREATURES WITH TWO SHELLS AND NO HEAD

To the gourmand the oyster is the king of molluscs, but to the naturalist, for all its beauty of inner shell and its gift of pearl, it is a degenerate. Unlike that curious young gentleman, little Tommy Noddy, who was all head and no body, the oyster is all body and no head. So are all the two-shelled molluscs.

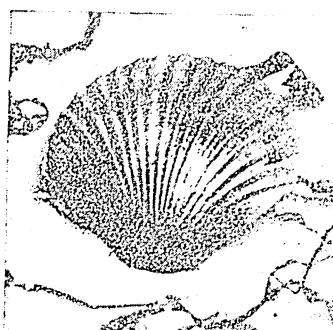
CURIOUS CREATURES AND THEIR HOMES



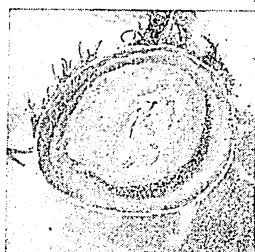
A SCALLOP SHELL



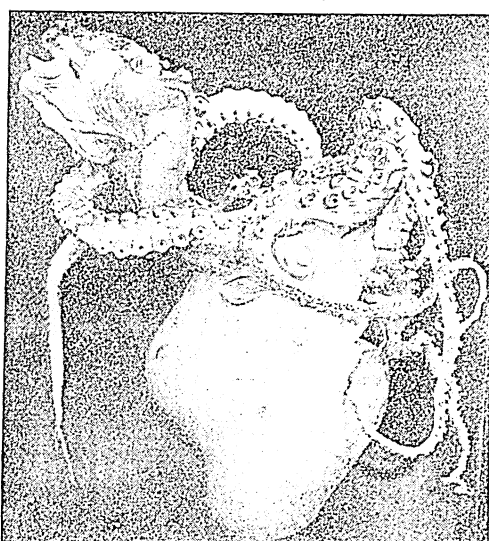
A GARDEN SNAIL



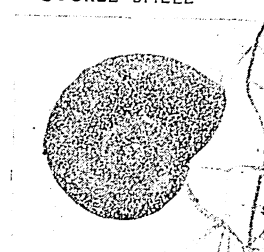
A COCKLE SHELL



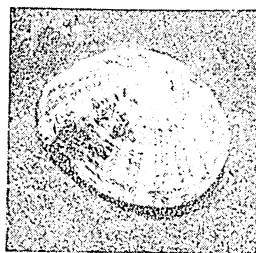
A LIMPET'S SUCKER



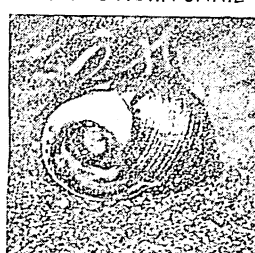
PAPER NAUTILUS, OR ARGONAUT, OUT OF ITS SHELL



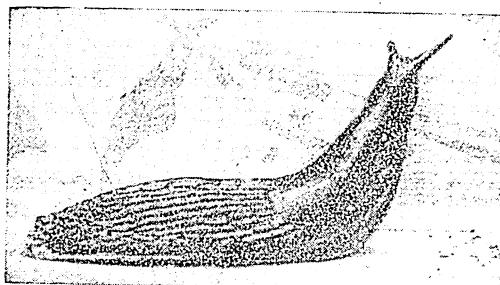
A RAM'S-HORN SNAIL



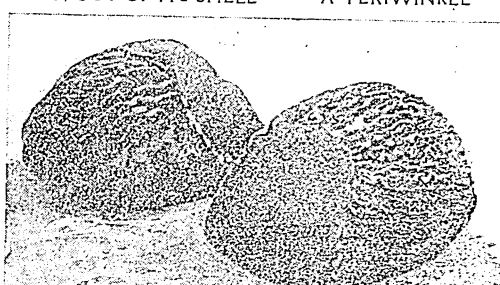
A LIMPET



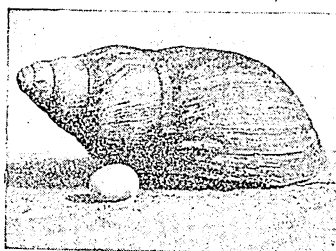
A PERIWINKLE



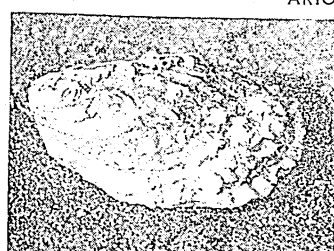
ARION EMPIRICORUM, A BLACK SLUG



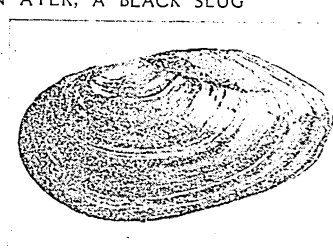
ARION ATER, A BLACK SLUG



AN EAST AFRICAN GIANT SNAIL AND ITS EGG



A COMMON OYSTER



A SWAN MUSSEL OVER FIVE INCHES LONG

The pictures on these pages are by Messrs. Berridge, Crabtree, Johnson, Step. Walmsley, and others

The one-shelled, on the other hand, the snails, winkles, whelks, and the rest, have heads, eyes, and tongues, of which last-named organ there is much to be told. Let us first see how a bivalve is compounded, and how it earns its daily bread.

The fresh-water mussel is a common object to those who probe the mud at the bottom of a stream, but we have had nothing more remarkable in all our studies. Within the two shells of the mussel is a soft mass of flesh and muscle, a broad, flattened ligament which is called the foot, the fleshy mantle which secretes the shell material, powerful muscles for closing the shells, a mouth, gullet, stomach, but no head, therefore no jaws, no tongue.

The mussel protrudes its powerful muscular foot, fills it with blood to make it swell, then pulls itself down into or along the surface of the mud, with such little haste that its best pace would carry it about 15 feet in the course of the night, when alone it makes its marches.

THE VALVES WHICH HELP THE MUSSEL TO MAINTAIN ITS SUPPLIES

In order to obtain food the mussel opens its shells and draws in water by the rhythmical waving of multitudes of tiny, hair-like *cilia*. These induce a flow of water into the mussel, conveying oxygen and food to the system. A motor-car engine has inlet valves and exhaust valves; the bivalve has its inlet and outlet. Not the least notable of the mussel's organs is one yielding a glossy, silk-like substance which provides cables with which to anchor the animal. We can see these strands binding edible mussels to the timbers and metal of our seaside piers. But note the astonishing rôle which the *byssus*, as we call this substance, plays in the life-story of the fresh-water mussel.

This animal does not broadcast its eggs as the oyster does. The eggs of a fresh-water mussel are exposed to such dangers that Nature has ordained that the mother shall incubate the ova within her body. The eggs hatch in tubular cavities in the gills of the mother; and it is an able-bodied little fellow, clad in a triangular coat of shell sharply pointed at both ends, that says farewell to its mother and takes the plunge into open water.

Its first act is to spin a byssus of sticky thread, which floats up in the water. An inquisitive minnow or stickleback is attracted and draws near. The byssus adheres

to it. The baby mussel has caught a fish, but not to eat.

The little mussel, excited by the contact, rapidly opens and closes its twin shells, and so swims up to its capture. Reaching the fish, it grips with the sharp extremities of its shell and establishes itself more firmly than the Old Man of the Sea on the shoulders of Sindbad. The terrible old ruffian of the story did but seat himself on the children's hero, but the mussel seats itself in the very flesh of its host.

THE STRANGE CRADLE OF THE BABY MUSSEL IN FRESH WATER

The irritation caused by the hooked shells causes a morbid growth of the fish's flesh, which, developing like a gall, embeds the little mussel, and makes it prisoner. That is exactly what Nature intends to happen. For three months the larval mussel rests there, travelling where-soever its host may choose. At the end of the third month it is a perfect mussel in miniature, and something happens to rupture the cyst in which it is enclosed, liberating the mollusc, and permitting it to settle down at the bottom of the water placidly to follow the art and calling of the perfect bivalve.

No such method is associated with the upbringing of the sea mussels of our coasts and estuaries. The eggs of these animals are cast into the water, and, as they develop, go to swell that enormous mass of food on which higher life-forms are sustained. The edible mussels are of economic importance. They are food to very many people, and good food, where their purity can be assured. Still more valuable perhaps, is their use as bait. There are English ports where fishermen use mussels in hundreds of tons a year.

The curious thing is that in many such centres the mussels needed by the fishermen are imported from abroad, from places to which we export the spat or developing spawn of mussels, while on other parts of our coasts native mussels are in such quantities that they are crushed and used as manure.

THE SEA-SPINNERS OF SILK WHICH HELPED TO BUILD A BREAKWATER

The ingenious way in which these edible mussels anchor themselves together by their silken strands produces so effective a defence of the situation to which they are attached that engineers turn the trait to account for human profit. When the breakwater of Cherbourg harbour was

THE GREAT MOLLUSC FAMILY

being made the engineers threw tons of live mussels upon the works, and left these strange sea-spinners to bind the parts of the breakwater together with their imitable silken cordage. Gloves have been made of these byssus threads, and we may yet find other uses to which they can be put in manufactures when the search for raw material becomes increasingly acute.

British mussels still yield pearls, as in the days of Caesar, not so fine, large, and lustrous as the pearls of the East, but still so esteemed that in 1923 the pearl fishers of the Highland rivers of Scotland found pearls, for one of which £47 was paid. These are called river pearls.

THE BEAUTIFUL LINING OF THE SHELL OF THE OYSTER

But the finest examples of pearls come from a group called the wing-shells, which are true pearl oysters, or rather pearl mussels. Our common oysters line their shells with mother-of-pearl, but the pearl oyster extends its labours to the formation of free globular pearls, lying loose within the mantle.

Such pearls may arise from the intrusion of grit or other foreign bodies in the sensitive flesh of the animal, and are then called seed pearls. The so-called culture pearl is a true pearl, a covering of nacre on something artificially introduced by the hand of man. But the pearl most prized is actually the tomb of a parasite.

It is a story stranger than any of the superstitious travellers of ancient days were wont to tell. A certain tapeworm attains maturity in the intestines of a great fish, the Indian ray, scientifically termed Trygon. Its larvae escape into the water and are drawn into the body of the mollusc with the fluid the oyster absorbs.

HOW THE LOWLY OYSTER PRODUCES A PEARL OF GREAT PRICE

There it irritates the oyster, which is not as placid as we think, and causes it to pour forth a fluid which we call nacre, and which, on hardening, becomes pearl. The nacre flows round the parasite, killing and inurning it. Layer after layer, film after film, is added, and in course of time, when the oyster is caught and opened, perhaps a fortune is found to lie within.

But not all the parasites are killed in this way. Many lie out of reach of the oyster's sensitive centres, so continue to grow till a trigger-fish, which always haunts the home of these bivalves, crunches up a pearl mussel for its dinner, becomes in turn the

host of the parasite, which then develops further, tunnels its way from the stomach into the flesh of the trigger-fish, and there lies dormant in a sort of capsule.

Ultimately the trigger-fish, which has eaten the mollusc, is eaten by a great sting-ray, in which the tapeworm reaches maturity, and lays its eggs, and these in due course escape to enter another oyster, and become pearls or parasites again.

The trigger-fish has most potent teeth, evolved to crush the shells of bivalves. But for those teeth in the trigger-fish there would be none of the great pearls of fact and romance.

The true oyster has its place in all literature, but merely as a course at the rich man's table; yet on its own account it is interesting enough to merit a book to itself. If we had an oyster under observation in a tank we should see it draw in water for breathing purposes and in order to extract the organic contents of the water for food. Then we might be fortunate enough to witness it in the act of depositing its spawn.

THE MOTHER OYSTER AND HER HUNDRED MILLION EGGS

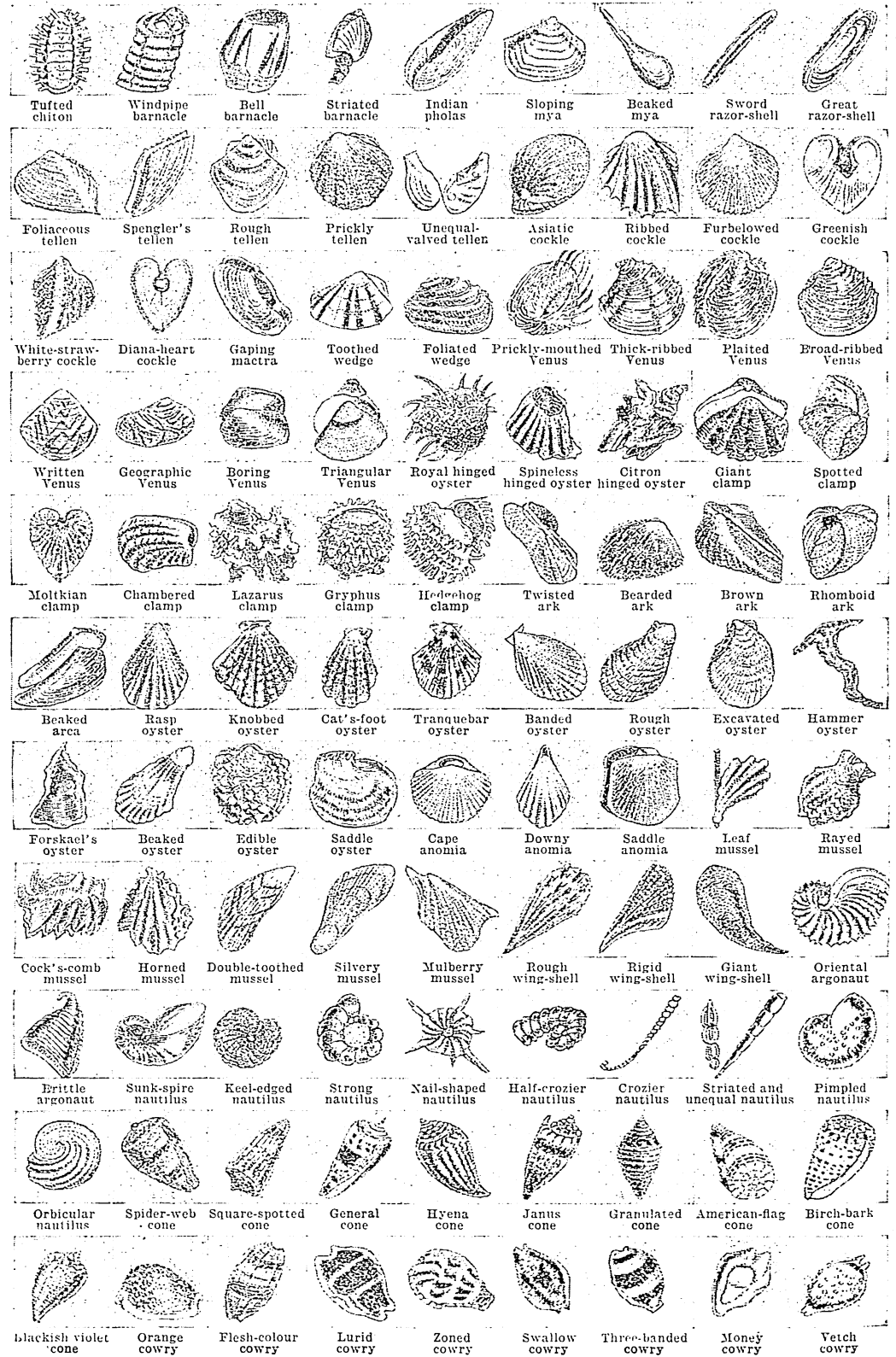
The spawn is, of course, simply a multitude of eggs. The water is discoloured by their immense number. A hundred millions has been named by some naturalists as the gift of a mother oyster to the lifetime of one season, and the strictest observation shows that one oyster does produce 16 million eggs at one time.

Within ten hours the eggs are hatched, and free-swimming larvae are seen to emerge. How enormous must be the vitality of the oyster to furnish life at this rate; not immature eggs which take weeks or months to mature and come to life, but so near perfection that within ten hours the baby oyster is out of its shell and frisking in the deep!

Although the oyster has not a vestige of brain, it is not wholly without intelligence; at any rate, we find it can remember. That fact is being made use of in a novel fashion. People have been killed from time to time by eating oysters which have been reared in contaminated waters, but that source of danger is now asserted to have been abolished. Yet poisoning cases have been traced to oysters bred in perfect conditions.

Research proves that this is due to the oyster opening its shell during transit from the water to the shop; it has been handled by uncleanly people, or been

TWO HUNDRED HOMES MADE BY MOLLUSCS



A COLLECTION OF LAND & WATER SHELLS



packed in infected material. Consequently it is now proved possible to teach the oyster to keep its mouth shut when out of the water!

Oysters are therefore being educated by being periodically removed from the water, then dried, and afterwards replaced in their beds. They learn in this way that to survive exposure to drought they must remain closed, and when the time comes to travel they remember not to open.

THE STRANGE MYSTERY OF THE OYSTER WHICH CHANGES ITS SEX

Life must be perplexing even to an oyster. The discovery has been made recently that these molluscs change their sex from time to time. The mystery is still under investigation, but it seems established that, while the young oyster is apt to be a male, it is liable to change into a female, and then, after laying its eggs, to become a male again.

Near by the oysters as a rule we find the scallops, larger, handsomer of shell, sometimes fastened to their home by a byssus, frequently roving with enterprise and ambition in search of fairer quarters. They progress rapidly in zigzag fashion through the water, forcing their way by a rapid opening and shutting of the shells. The large shell of the Great Scallop, or Clam, is often to be seen in use at seaside places as a drinking vessel. We must not, however, confuse it with the real giant Clams, of which there are several species, to be found only in tropical and sub-tropical seas. These deserve the name of giant, for the shells of the greatest examples, weighing as much as 500 pounds, serve as little baths among natives.

THE COCKLES WHICH HOPPED LIKE LITTLE KANGAROOS

We have at home smaller bivalves in the cockles, which, in a perky, active way, are as interesting, for though they hide in the sand, whence they have to be dredged out with nets, they can hop on their long, muscular foot like bivalve kangaroos. This ability in the cockle was momentarily forgotten by an Australian naturalist who, to his great joy, caught cockles of a kind which previously only fossil relics had been found. He put his treasures on the seat of the boat, only to see them calmly hop right out of the boat and back into the water.

File-shells, so-called from the file-like character of the shell, not only from any filing action which it performs, are common

to our waters, and interesting from the fact that this mollusc, like the caddis-worm, erects around itself, when stationary, a collection of broken shell, mineral fragments, and other debris, binding all together with its byssus into a capital little fortress. The Venus shells are beauties in regard to structure and colour, members of the Tellin family, deep burrowers in sand and mud where the purpose of their beauty is not apparent to human understanding. They and the handsome wedge-shells are relatives of the cockle, but are not much used as food.

They have clear affinities with an important group in which are the gapers, bivalves which burrow in mud or sand, leaving above the surface a fleshy siphon which serves to draw in water and food for the hidden animal. Next to them come the razor-shells, common on our shores. Here the two shells are long, thin, and narrow, ideally fitted for quick descent into sand or mud, the motive power being supplied by the foot, and the outline of the shells affording the least resistance to such progress. Some of the razor-shells mine soft rock, but for the highest power in this direction we must pass to a fresh sub-order, the piddocks and the teredoes.

THE WONDERFUL TUNNELS MADE BY THE PIDDOCK IN THE ROCKS

The piddock, whose scientific name is the pholas, unrivalled among molluscs as a borer of stone, timber, and other substances. It is very ancient, and must have played an important part in shaping coastlines. Piddocks destroy wood and they bore innumerable tunnels in stone and rock year after year, century after century, letting in water to fret away the rock and bring it crumbling down.

The mollusc which we most dread, however, is the ship-worm, or teredo. Present in practically all seas near the shore, it is a long, worm-like animal, with two small shells at the head which serve it for boring implements. The larvae are free swimmers, which, coming in contact with wood of any sort, attach themselves to it and tunnel, not to eat the wood, but to fashion a home for their soft bodies, and to feed on the organic trifles carried to them from the outer water.

The teredo is one of Nature's watchdogs, which has become an enemy of navigation and the marine arts of man. For millions of years it tunnelled and

THE GREAT MOLLUSC FAMILY

broke up trees and driftwood brought down the rivers, which threatened to dam the waterways, flood the surrounding land, and convert possible future homes for man into marshes.

Man arrived, and in due course took the sea with his ships of wood, built himself little piers, fenced out the sea with the trunks of trees and hewn timbers. His works and his vessels appeared where the teredo had long been accustomed to see a home in any timber brought into contact with the sea, and it took to his possessions with the rest. It bored the hulls of his ships and became the paramount animal terror of the mariner. It attacked the timber work of harbours, causing slow but enormous damage.

Less than two centuries ago these so-called ship-worms endangered the existence of Holland. It was discovered that the teredo had eaten far and near into the timber sea-defences of the land, and terror seized the little nation which had never feared human armies on land nor enemy navies at sea.

BRAVE EXPLORERS WHO WERE SENT TO THEIR DOOM BY THE LITTLE TEREDO

In the long record of world exploration the teredo, it is supposed, accounted for many a little ship which sailed to the tropics on the other side of the world and vanished for ever from knowledge. When at last it was recognised that no chemical treatment of timber could keep the teredo at bay, copper sheathing for the hulls of ships was applied, but, as exhibits at the United Services Museum in Whitehall show, copper sheathing was apt to be torn away, and wherever that happened, in went the deadly teredo, to work secret damage till, perhaps, the good ship went down with all on board.

There we will leave the bivalve molluscs, and pass to a higher group, the univalves or one-shelled molluscs. The connecting link is found in the tusk-shells, which, beginning life with two shells, mature with one, but with a head. From round about the head project many delicate filaments which are protruded into the water to catch microscopic types of life. They are called tusk-shells, not because they have tusks, but because their shells resemble tusks in outline.

Another intermediate step between the two-shelled and one-shelled molluscs takes us to the chitons, or mail-shells, animals in which the shell is in eight hinged

segments, with chitin on the upper surface and shell on the underside of the plates. The hinged scheme of armour suggests the armadillo and the woodlouse, and the chiton, like those two creatures, rolls itself up when threatened.

THE HOUSE OF THE SNAIL WITH ITS LITTLE FRONT DOOR

From this point we are launched among the great company of single-shelled gastropods, the snails, whelks, and so forth. Here we have a soft-bodied animal set in a shell, the body marked off into head, eyes, feelers, a projecting hump in which the vital organs are contained, this part being well divided from the under part, the great muscular foot, on the upper back part of which appears the operculum, that horny disc with which the animal closes its shell, as with a front door. Not all gastropods have this security device, but everyone who has seen a periwinkle realises how excellent a barrier it forms.

The most remarkable feature of the snail tribe, from the popular point of view, is the tongue or radula. This is a ribbon of chitin, fitted with row on row of little horny grapnels, which play the part of teeth.

These teeth are arranged in rows across the long tongue, and vary in number with the species. The fewest are found in a sea slug which has less than a score of teeth all told, while the common sprinkled snail of the garden and hedgerow has a serried array of teeth in 135 rows, one behind another, and 105 teeth to each row—over 14,000 in all. The large pond snail has 12,000 teeth, the small fresh-water limpet has 9000; the amber shell over 3000, while a Mediterranean mollusc is estimated to having something like 750,000 teeth.

THE FORMIDABLE TONGUE WITH ITS MANY ROWS OF TEETH

But of course there is no resemblance between molluscan teeth and the teeth of mammals. They are minute hooks of horn set in a ribbon of chitin, and are not all used at once. Indeed a small part of the tongue comes into play at a time, the remainder being kept in reserve at the back of the mouth to take the place of teeth in front which have become worn.

This formidable tongue is protruded by the animal, and licks the vegetation or flesh which forms its food. A lion's tongue, when it licks, takes flesh and blood with it. The snail's and whelk's tongue rasps in the same way. A cabbage which

has been attacked by a snail or slug looks as if the tissue had been slowly rubbed off, and that is the case; it has been filed away by the snail's rasp, and the part which we miss has gone down its throat.

We need not wonder at that, for does not the whelk rasp its way through the shell of the oyster and banquet on the contents? Many land molluscs commit attacks of this kind on other gastropods. Some of the slugs and snails are mainly flesh-eaters. Even the vegetarian species may make a change of diet in captivity. In such case snails, when spring returns with abundant green food, have been known to refuse their usual diet, and, missing the flesh which was now denied them, have calmly eaten each other! The great slug *Arion ater*, the monster whose depredations in the garden we all dread, eats worms alive or dead, and eats other slugs alive. It has been known to eat sand containing organic matter, and it will readily turn from vegetation to devour green-fly and other insects.

THE SILVER TRACK MADE BY THE SLUGS AND SNAILS

The slug, therefore, is a friend as well as a foe, a scavenger as well as a robber. The same may be said of certain of the land snails. They are known to eat beetles, other snails, fungus, and lichen.

All slugs and snails make their own track of slime along which to glide, and it is by their glistening traces that we follow them, though not always to find them. Where food is plentiful they go and return with great regularity, and where slugs and snails have been, slugs and snails will be found year after year, the same snail, year after year, if it be not disturbed.

But that they have enterprise and the desire to travel we know from their sudden appearance in new places. An authentic story is told of a couple of English snails, one strong and hardy, the other weak and sickly, which were placed by a kindly hand in an ill-furnished garden.

The strong snail made its way over a wall into the well-stocked garden next door and was believed to have gone for good. But 24 hours later it was found to have returned. Apparently it held a conference with its sickly companion, for shortly after both took the track which the pioneer had followed, and both went over the wall into what must have seemed, to a snail's imagination, the equivalent of a land flowing with milk and honey.

Snails can seal their shells with a form of mucus which hardens into a covering for the winter; slugs can envelop themselves in slime. That slime they can convert into cables. In the water there are molluscs of this order which spin a thread in the water, attach it to the surface, apparently by a depression in the upper end of the line of slime which admits a bubble of air, and so floats with buoyancy enough to hold the animal at the distance below the surface at which it desires to remain. That enables us better to grasp what follows.

THE SLUGS THAT DEFEATED MEN IN A BATTLE OF WITS

In Kew Gardens slugs played havoc with precious orchids, so the plant-pots were placed in bowls of water and the plants themselves were enveloped in cotton-wool, over which even the slimiest slug may be supposed incapable of travelling. But were the slugs defeated? No, they climbed the rafters of the conservatory and let themselves down by threads of slime on the flowers of the orchids which human ingenuity had guarded in vain.

These gastropods are marvels of endurance. They exist far up in the Arctic circle; they flourish in the desert where plant life is sparse and almost non-existent. They hibernate through the bitter winter; they bury themselves and sleep, fasting during the torrid heat of summer. Moisture brings them out in such myriads that people imagine they have arrived on the wings of the wind. If all favours them, they live about five years, so far as observation goes, and they may live much longer.

THE STRANGE THING THAT HAPPENED IN THE GLASS CASE OF A MUSEUM

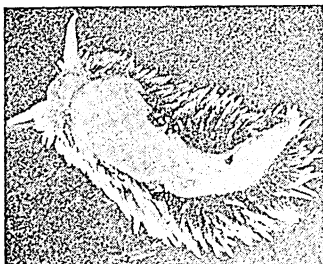
The suggestion is prompted by an extraordinary occurrence in the Natural History Museum at South Kensington, where two desert snails, whose scientific name is *Helix desertorum*, were brought home from Egypt, where they had been in the possession of their finder some time before arrival in England. Supposed to be dead, they were fast gummed down, like other exhibits of the kind, to the usual tablets and left in their show case. Five years passed, with nothing to indicate the faintest flicker of life in either. Then chance led to an examination, and the discovery was made that one of the snails had been newly repairing the crust which closed the entrance to its shell. Both

THE GREAT MOLLUSC FAMILY

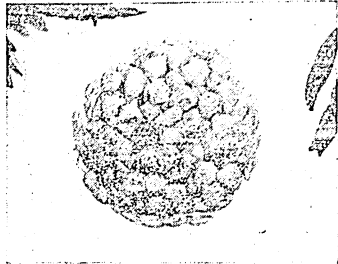
the snails were taken out and placed in tepid water. One forthwith revived, and began repairing the lip of its shell which had been damaged in fixing it to the label.

Since then many other examples have been collected to demonstrate the almost unbelievable tenacity of life characteristic of snails which we were wont to think must have constant food and moisture or die. Snails have been found in the Sahara

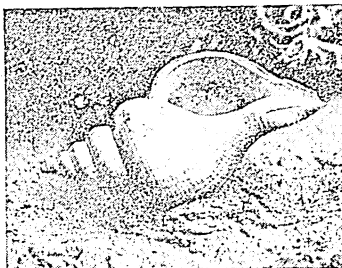
We must go down to the sea for other treasure and spend a few minutes with the limpets. Here the shell is single, but conical, not a spiral like that of the snails and periwinkles. There are many kinds, but the common limpet is as interesting as any. By pressing its powerful sucker foot on the rock it gets such a grip that it can scarcely be detached by a direct pull. Sideways it may be suddenly wrenched



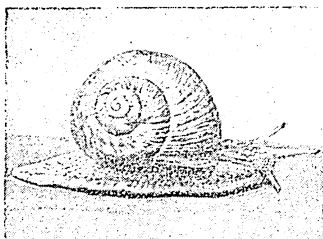
A SEA SLUG



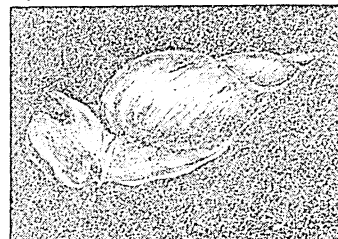
EGG CAPSULES OF THE WHELK



WHELK SHELL



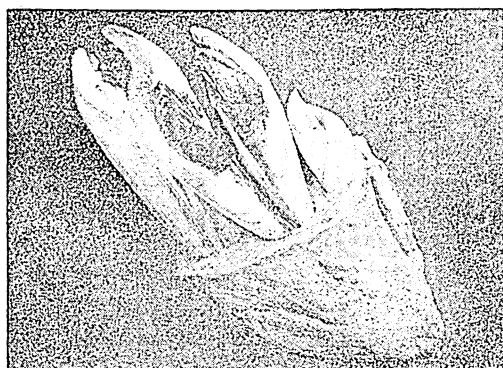
ROMAN SNAIL



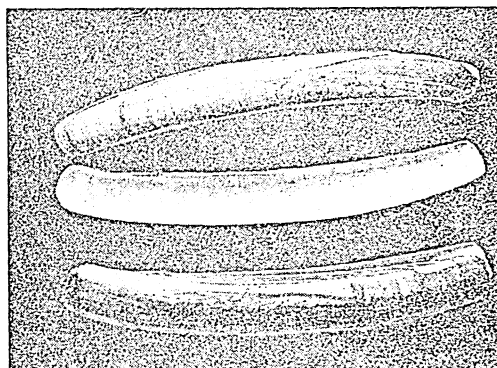
POND SNAIL



EDIBLE SNAILS



PIDDOCKS



RAZOR-SHELLS

sands where the day temperature was 122 degrees Fahrenheit, where no rain had fallen for five years. Others kept without food or water for four years in a collector's drawer were placed in water and revived; and six months later one of them was the mother of thirty baby snails.

These are facts comparable with the weird records of the longicorn beetles, and quite eclipse the feats of endurance achieved by the much-enduring toad.

from its grip, but not if it has warning of impending danger.

A good naturalist took advantage of this fact to save his life. He had fallen into the sea in Scotland in a deep, rocky place where to climb out was impossible, owing to the slipperiness of the steep rocks. Drowning seemed inevitable with the rising of the incoming tide. Fortunately he noticed some big, encrusted limpets clinging to the rocks, and he knew their power.

But they must be made aware that they were likely to be dislodged by sudden pressure. So he gave each of them a sharp tap in turn. They clung with might and main and he climbed up on them, using them as stepping-stones to safety.

The limpet secures its hold not only by means of its great muscular foot ; somehow it manages to scrape or erode in the rock a hole exactly matching the outline of its shell. Whether this is done by a cutting action, or whether by the aid of an acid which the creature secretes, is not yet certain, but the acid theory has high authority for acceptance.

For limpets to stick is a proverbial performance, but they do not remain stuck. They move with each tide, down the rock to scrape off with their tongues the fine weed growing on the stones. Then each limpet returns to its own niche, never mistaking another's. It would be useless to attempt to invade another limpet's home, for no two are exactly alike, and each must fit into its own retreat. They go out and they come back infallibly. Yet every common limpet is blind !

THE GORGEOUS COLOURING OF THE COWRIES OF TROPICAL WATERS

Wentle-traps, very beautiful of shell ; murices, which bore through the shells of other molluscs and secrete a fluid which gave the ancients their famous Tyrian dye ; whelks, which tunnel the shell of the unfortunate oyster ; periwinkles, which teem among the sea-weed and other vegetable debris between high and low tide ; cone-shells, remarkable for beauty and of high value in the market ; these and scores of other species are in our present group, in which one other eccentricity must be noted in the Pelican's Foot, a shelled mollusc not distantly related to the cowries.

We have three British species of cowry, but the kinds famous for splendour are the product of tropical waters. No more lovely colouring is to be found than among the cowries, though why such charms should be lavished on their shells is not obvious, for the fleshy mantles cover a great part of the shells. Then those mantles again are of the richest hues, an extravagance of rival charms of hue competing in the same mollusc.

As already remarked, these cowries have been long used as money in primitive parts of the world. Gradually their use declines as metal makes its way as a

currency for natives, but the cowry has had a value as the equivalent of gold, silver, and copper for more years than history is able to recount.

THE TRITON SHELLS WHICH THE ROMANS USED AS TRUMPETS

Beautiful natural architecture and colouration are found again among the wing-shells and the fountain-shells, the fountain-shells, four to five pounds in weight, being ground to make fine porcelain, or used for cameos. Helmet-snails are taken from the sea to serve the cameo-cutter, too, while the tritons served the Romans as a trumpet, and in the South Sea Islands today answer as a war clarion among the natives.

The most notorious of all the molluscs, the cuttle-fishes and their allies, have already been dealt with in our story of deep-sea life, but we must note their nearest kindred, the nautilus, sole survivors of a race with which the seas once teemed. The nautilus possesses a shell, and lives in its outermost chamber, not in the whole of it. The foot round about the mouth has numerous tentacles, which can be withdrawn into shields.

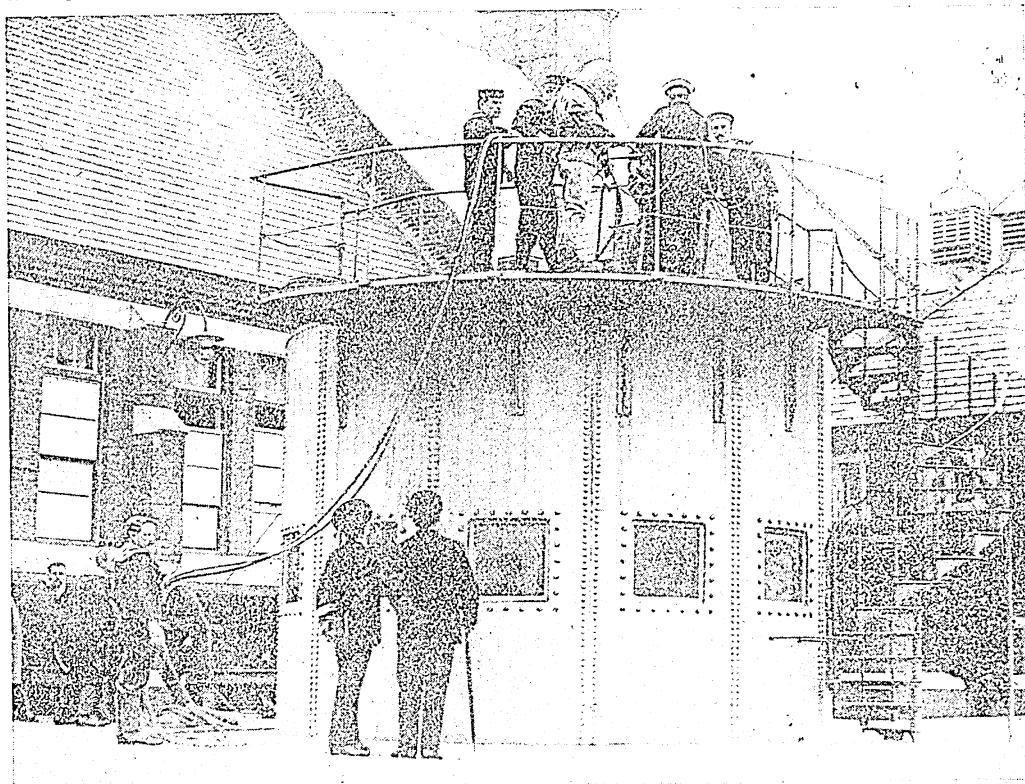
In its youth the nautilus occupies a shell shaped like a horn, but as it develops the shell becomes a chambered spiral, and the fleshy body, continually drawn towards the opening, leaves the earlier parts of the shell. The later developments wind round and enclose the earlier, and the central chambers of the shell become filled with a natural gas. The exterior of the shell is covered with a thin membrane, which is removed when the animal has been caught, to reveal a substructure of sheeny mother-of-pearl.

THE OLD LEGEND OF THE NAUTILUS WHICH MISLED THE POETS

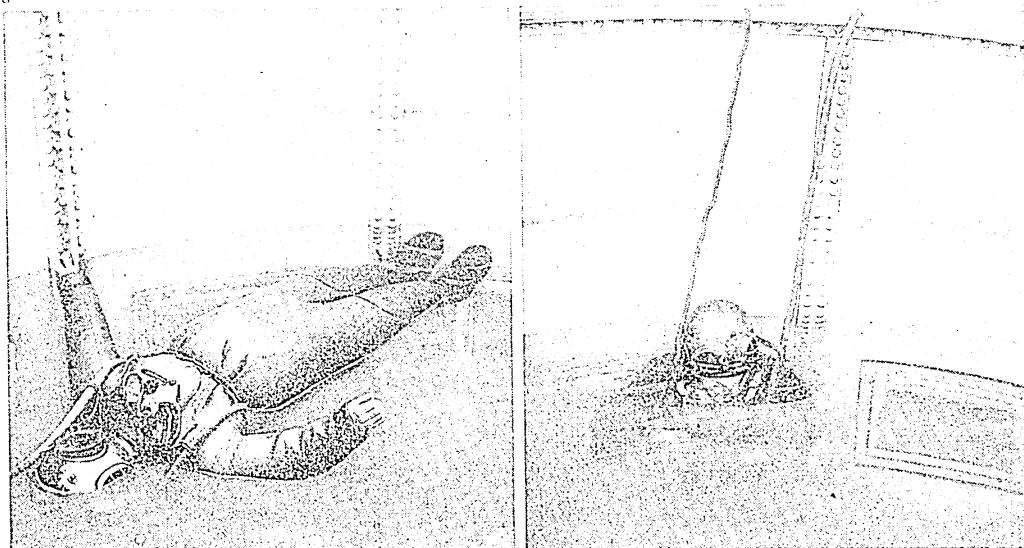
Ancient tradition attributed to the nautilus the power of raising its arms to the wind and swimming with them as sails. Poets and others remember the legend and still accept it as truth. The fact is that the nautilus propels itself through the sea by squirting out water in the same manner as a cuttle.

The paper-nautilus is a different animal. Only the female here has a shell, and that exists simply as a cradle for her eggs, one of the loveliest cradles in the world, a charming evidence of the care and genius, we might almost say, of Nature in providing for the safety and well-being of the defenceless young of a species.

PICTURE-STORY OF THE DIVER'S WORK

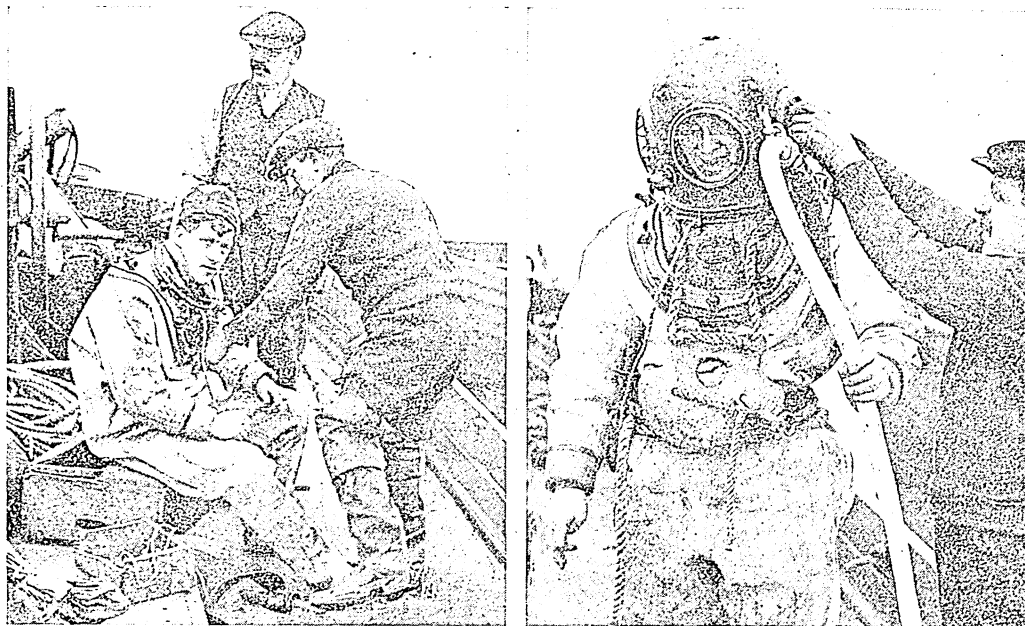


The diver's occupation is probably the most dangerous as well as the most fascinating in the world : fascinating when we think of what he may see or find and do in the depths of the ocean ; dangerous because he works where the pressure of the water would crush him like a heavy weight but for the compressed air that is pumped into his dress to equalise the pressure of the water outside. Some of the most skilful divers are in the British Navy, and this picture shows the glass-windproof tank at Whale Island, Portsmouth, where the naval diver has his first lessons before diving in open water.



As a diver ascends, he allows the air to escape from a valve in his helmet as it expands owing to the decreasing water-pressure. If air gets into the legs of his dress he may be capsized and rendered helpless as in the picture on the left, where his outlet valve is below water and he cannot move his arms. Patent dresses are therefore made with lace-up legs which admit no air, so a diver, as the picture on the right shows, can rise safely, head upward.

THE DIVER GOES DOWN TO THE OCEAN BED

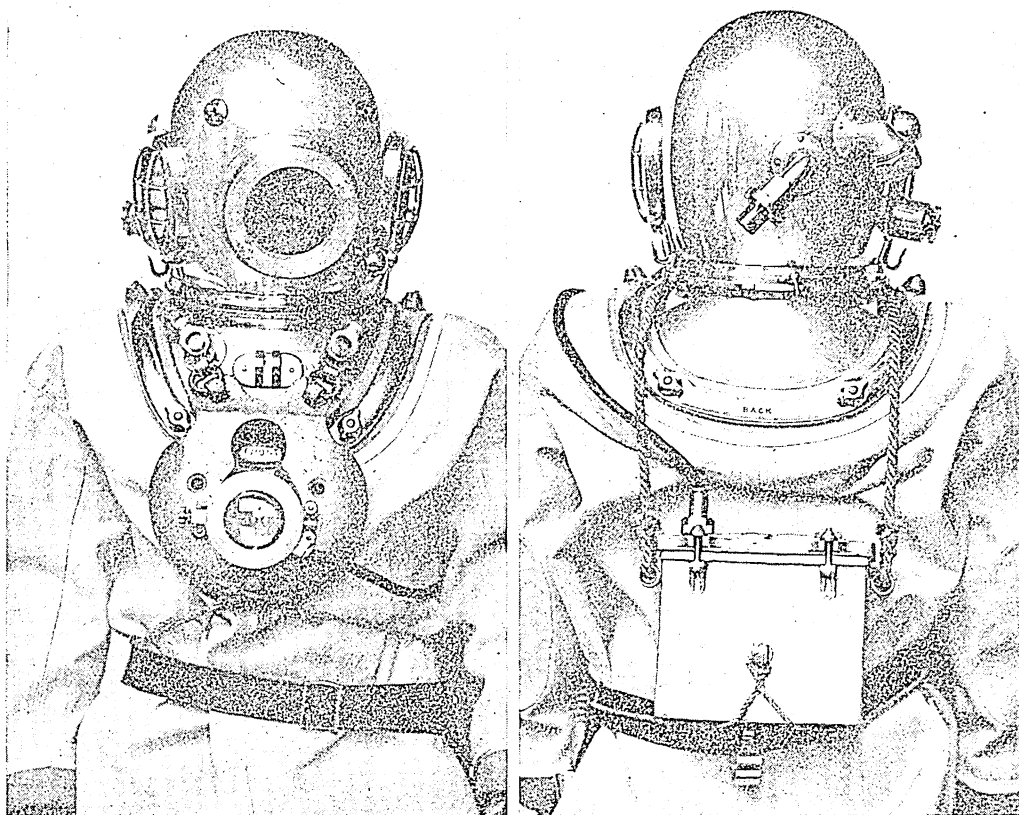


The diver's apparatus consists of a helmet secured to a corselet, which is clamped to a waterproof rubber diving dress covering the whole body except the hands, and supplied with air through a flexible tube connected with an air-pump. On his back and chest he carries leaden weights of 40 lb. each, and on each boot is 16 lb. of lead, the whole equipment weighing about 175 lb. Here we see the diver being dressed and his helmet with air-tube being screwed on.



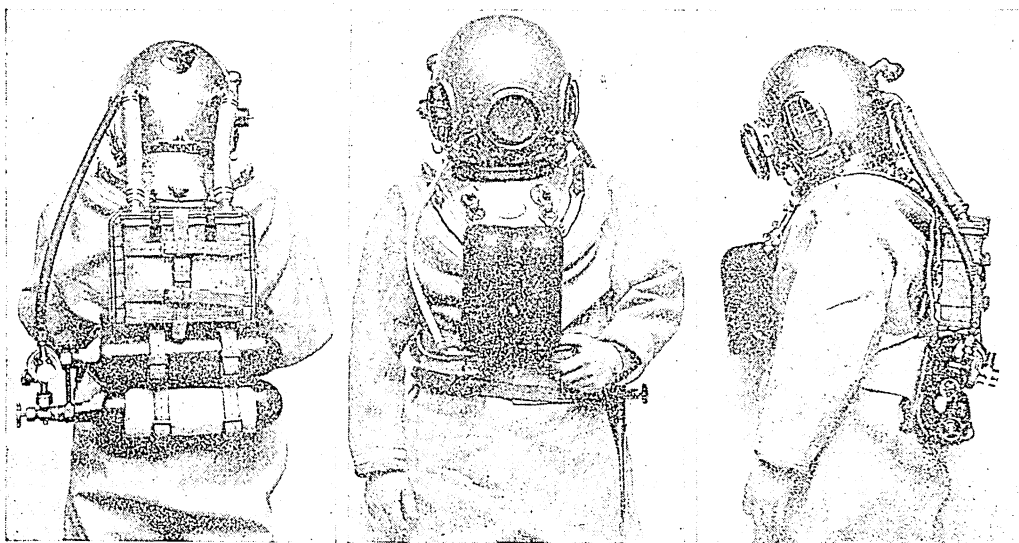
The diver steps from the ship on to the ladder and descends by a shot-rope—a rope with a heavy weight or shot attached, which has been previously lowered to the bottom. Attached to his waist is a signal, or life, line often carrying telephone wires. At the bottom, so that he can wander about, he holds a distance-line attached to the weight and can thus easily find his way back to the shot-line. Here we see the diver going down.

THE DIVER CARRIES HIS OWN AIR.



Sometimes the diver carries an electric lamp which is set in the front weight, and can be turned as required. It takes its current from the ship or from a portable battery.

If the current is supplied from a battery, this is carried in a metal watertight case which takes the place of the metal weight usually carried by the diver on his back.

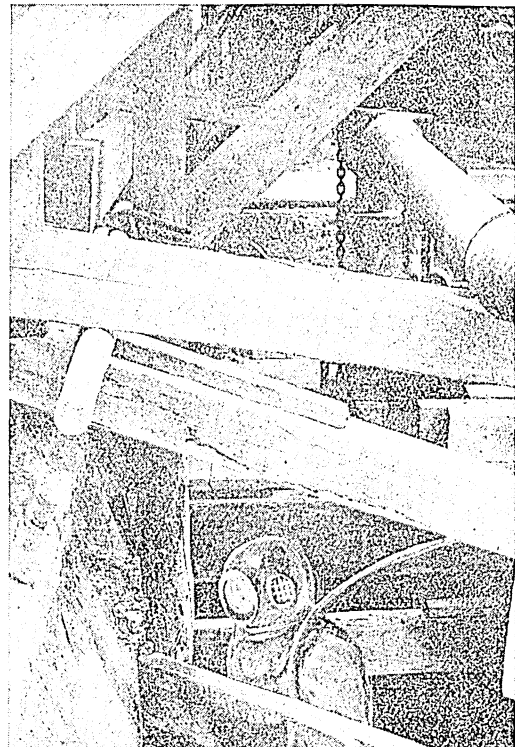


In the self-contained diving apparatus the wearer is supplied with air without the aid of an air-tube connected to a surface-pump. He breathes a highly-compressed mixture of air and oxygen supplied from cylinders which he carries on his back as seen on the left. Smaller reserve cylinders are carried on his chest. The carbon dioxide in the air he breathes out is absorbed in caustic soda in a metal chamber, so that the air is rendered pure and fit for breathing again.

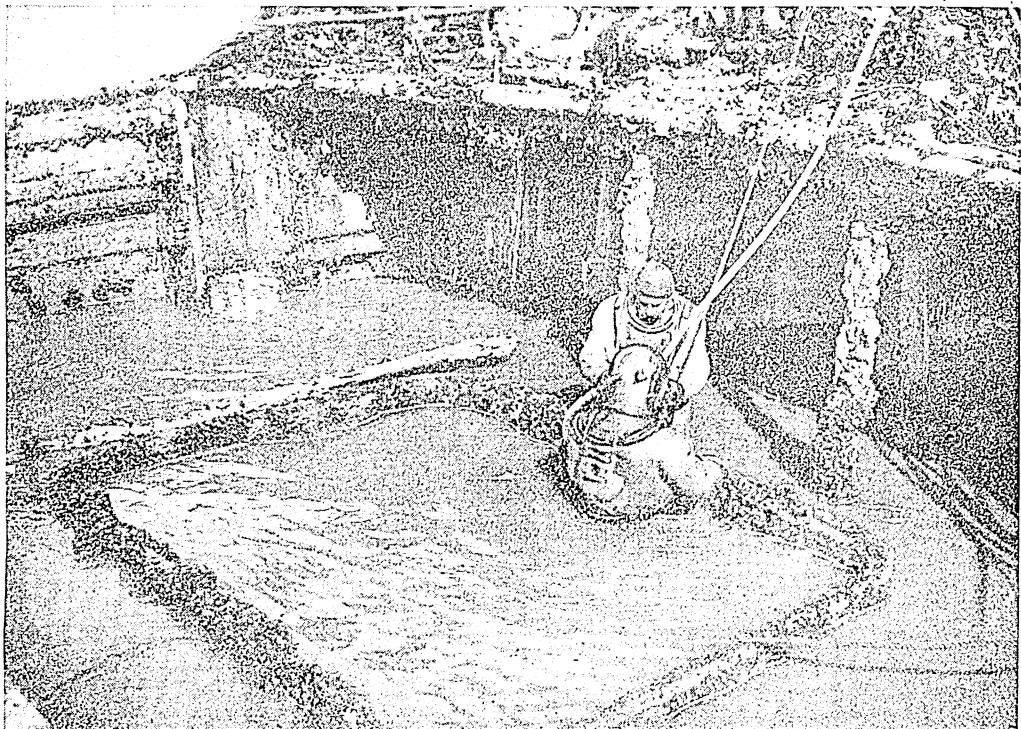
A DIVER UNDER A CATHEDRAL



Here a diver is seen connecting up a charge of dynamite for blowing up an obstruction near a sunken ship at Zeebrugge. The old cranes, sunk by Germans, were raised by divers.



When Winchester Cathedral, built on a peat bog, began to sink, this diver, working in the dark by feeling, dug out the bog and put in a firm concrete foundation.

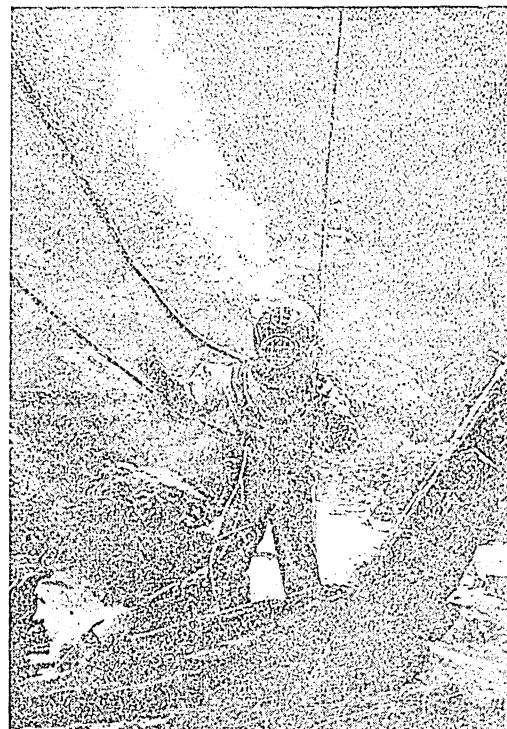


The ruthless destruction of ships during the war provided much salvage work for divers all over the world. Here we see a diver of the Admiralty Salvage Board going down into the hold of SS. Brussels after she had been raised at Zeebrugge.

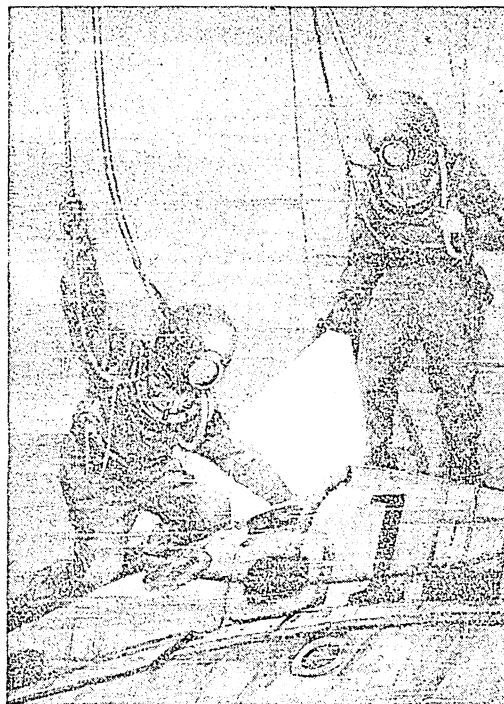
STRANGE SIGHTS SEEN IN THE SEA



One method of raising a sunken vessel is to send down divers to patch up the holes, and then to bring her to the surface by pumping the water out.



To take a walk on an old sea-bed must be a wonderful experience. This diver, photographed under water with air-bubbles streaming from his helmet, is inspecting an old wreck.

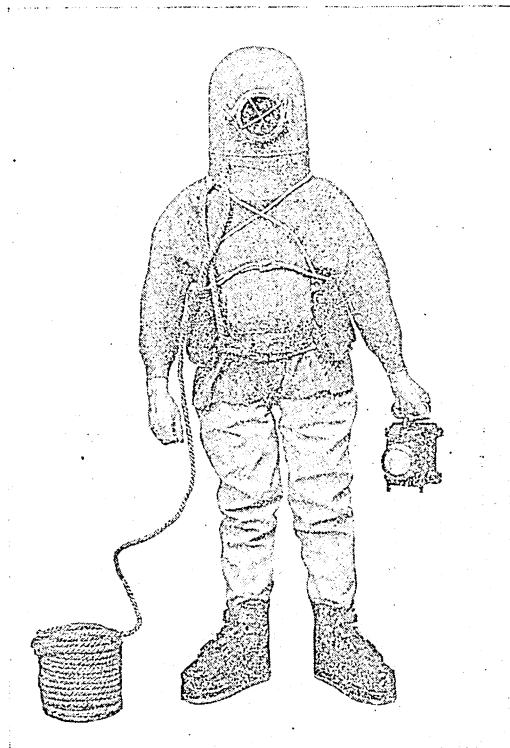


The raising of the once mighty German Fleet at Scapa Flow was a formidable task for the salvage men. Here we see divers examining a sunken submarine.

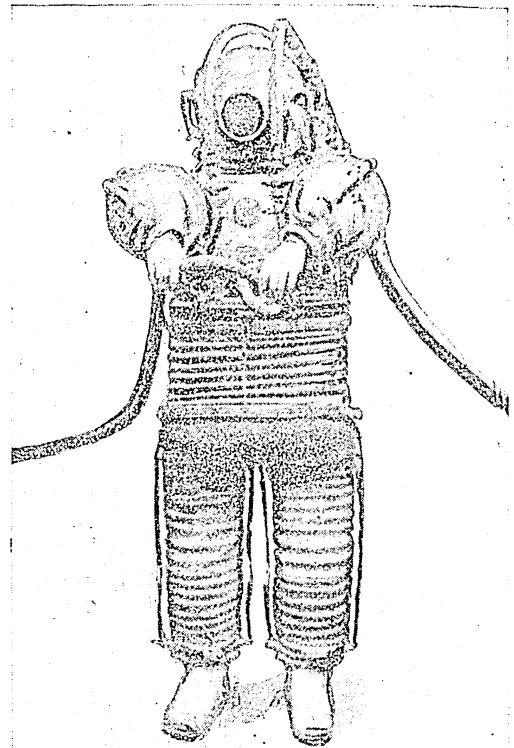


The salving of the millions in the Laurentic was the greatest treasure hunt of modern times. Here is a picture of a diver recovering gold, made to illustrate a story.

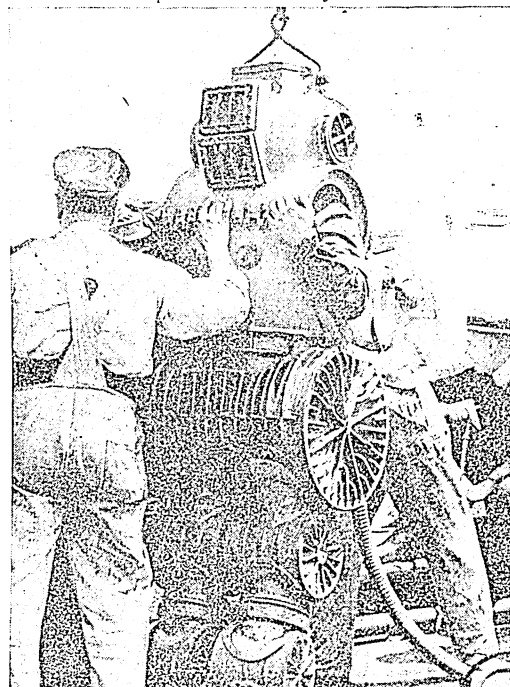
THE DIVER AND HIS DRESS



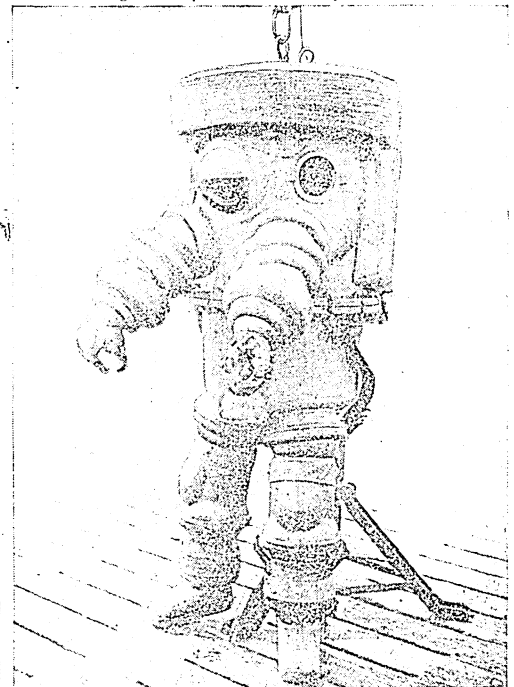
This type of self-contained dress is used for shallow water and enables a diver to stay for about half an hour at a depth of about twenty feet.



This dress of stout copper with legs of metallic springs, designed by two Australians, enables a diver to withstand pressure at great depths without air-pressure inside.



A very unusual type of dress is here illustrated. Though clumsy to the eye of the landsman some of these dresses enable a diver to move very quickly at depths where the water-pressure is exceptionally great.



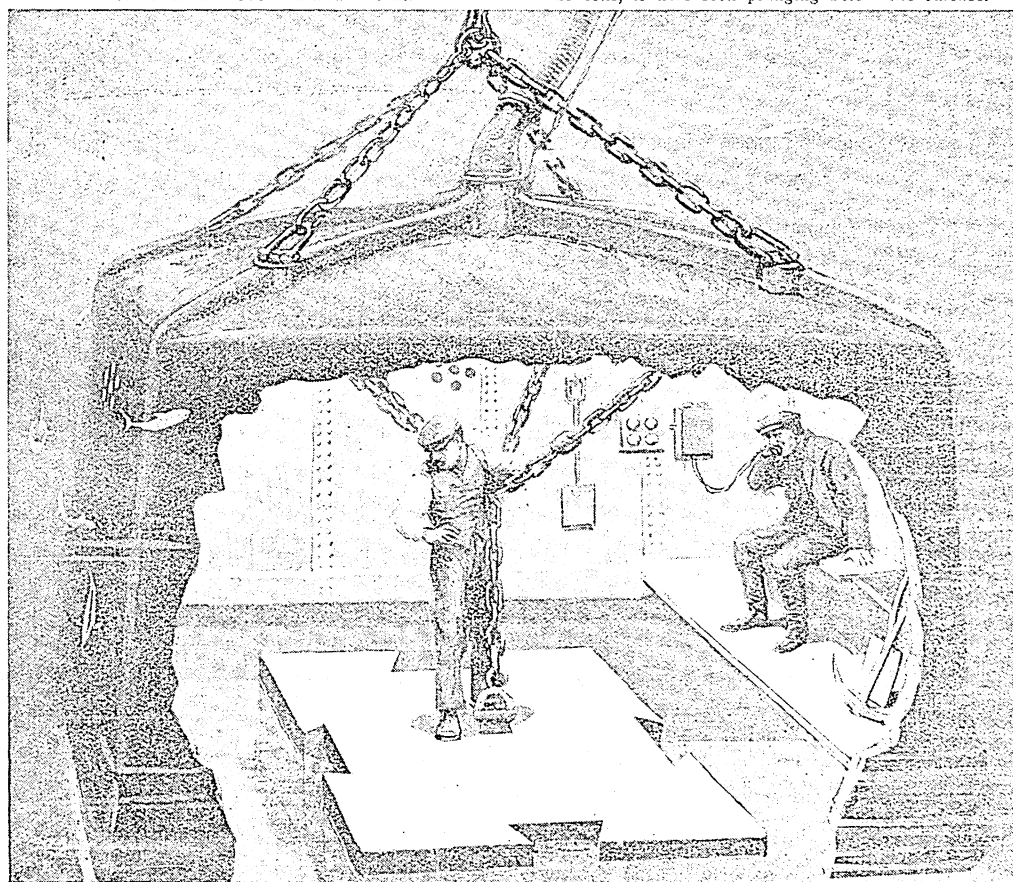
This strange garb, the legs, arms, and fingers of which are fitted with ingenious joints, is in use at Hamburg. It has been proposed to use it in an attempt to salvage the Lusitania and other ships lying at great depths.

THE WORKMAN'S DIVING-BELL



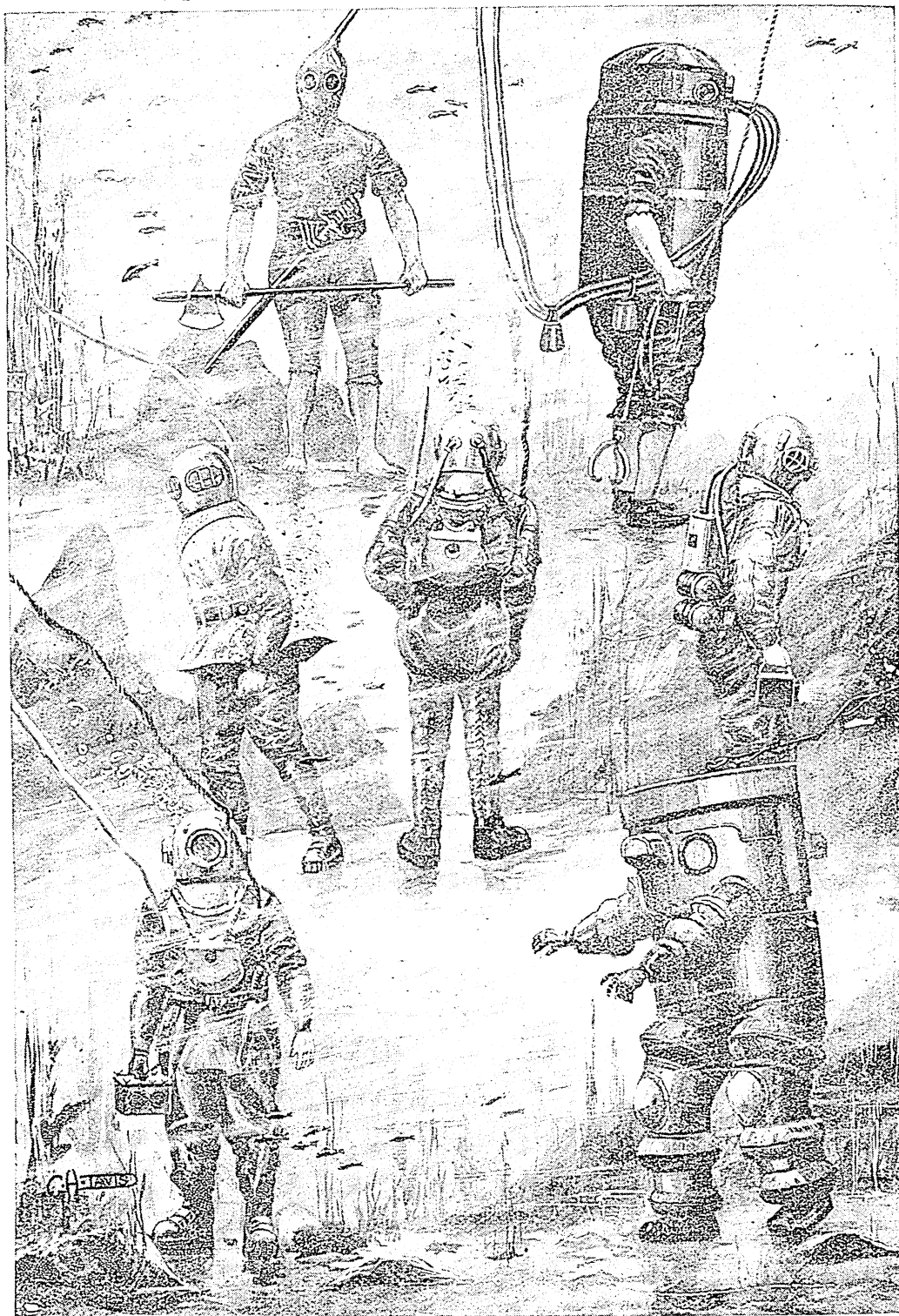
This monster diving-bell, 18 feet long and over 6 feet high, weighs about 35 tons. It was employed in the construction of Dover Harbour works.

Folkestone Harbour extension works were carried out with the aid of several diving-bells, one of which, weighing 26 tons, is here seen plunging below the surface.



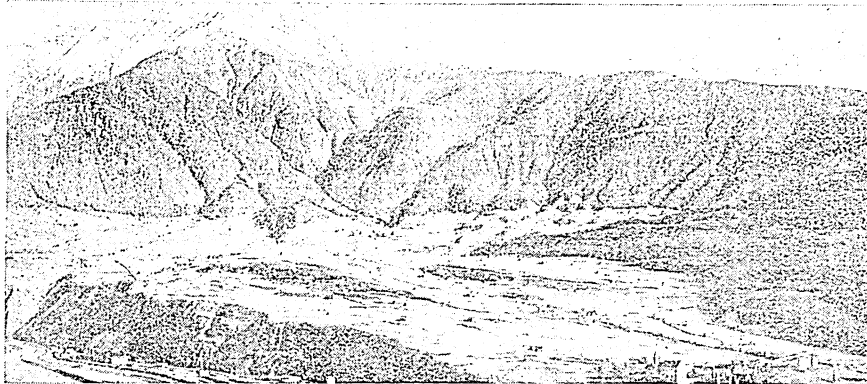
Here we see the interior of the ordinary diving-bell, which was devised by James Smeaton. Largely used for excavation work and for laying foundations on the sea bottom, it is built of steel plates and is heavy enough to sink readily when the water is blown out by air forced in through the pipe in the roof, and to prevent strong currents from moving it. Lenses are fitted at the ends, and it is also supplied with electric lights, a telephone, and tackle for moving heavy objects.

FASHIONS FOR THE OCEAN BED



These pictures show the evolution of the diving suit. The suits at the top were made about 1500 and 1798. The next was invented in 1819, and from it has been evolved the diving suit of today, as seen in the centre. The suit on the right of the middle row is used in mines and is self-contained. The two suits below are for deep sea work, that on the right being designed for use 1000 feet down—a depth no man has yet reached.

Plain Answers to the Questions of the Children of the World



The Alps where the longest tunnel in Europe passes through them

WHAT ARE THE BIGGEST TUNNELS IN THE WORLD?

THE biggest tunnel in the world is the Shandaken tunnel in America, a part of the Catskill aqueduct system which carries water to New York City. This tunnel is over 18 miles long, 11½ feet high and 10¼ feet wide. It conveys the waters of the Schoharie Creek to the Ashokan Reservoir.

The biggest railway tunnel is that under the Simplon Pass, piercing the Alps between Italy and Switzerland. This is 12½ miles long and joins Brigue and Iselle on the route to Milan. It cost about £3,000,000. A second Simplon tunnel was completed in 1921.

Other Alpine tunnels with their lengths and the dates of opening are given here :

1871, Mont Cenis, between France and Italy, 8 miles.

1881, St. Gothard, between Goeschenen and Airolo, 9½ miles.

1884, Arlberg, from Langen to St. Anton, 6¾ miles.

1909, Wasserfluh, between Brunnadern and Lichtensteig, 2 miles.

1913, Loetschberg, in the Swiss Oberland, 9½ miles.

The cost of these tunnels ran into many millions, the Mont Cenis costing £2,600,000 and the Loetschberg £2,000,000.

A tunnel five miles long and two miles above sea-level pierces the Andes, in South America, and affords direct com-

munication between Valparaiso on the west and Buenos Aires on the east. It was opened in 1910, and other railway tunnels through the Andes have since been projected.

The most notable tunnels in England are the Severn, from Monmouthshire to Gloucestershire, between four and five miles long, opened in 1886; the Woodhead tunnel under the Pennines, between Dunford Bridge and Woodhead, three miles long, and the Blackwall tunnel under the Thames at London, a mile and a half long, opened in 1897.

Canada has some remarkable tunnels. One of these, completed in 1916, on the Canadian Pacific Railway, pierces the Selkirk Mountains under the Rogers Pass and is five miles long with a double track. More wonderful still are the spiral tunnels on the same railway, between Hector and Fields in British Columbia. These consist of two spiral tubes, the westerly 3255 feet long under Cathedral Mountain, and the easterly 2921 feet long under Mount Ogden, with the Kicking Horse River between. They cost £300,000 and were remarkably cheap at the price, for they halved the gradient on the line there, saving an enormous expenditure of power on the part of the engines using the line.

FIRE · WIND · WATER · LIFE · MIND · SLEEP · HOW · WHY · WHERE

A famous railway tunnel in New Zealand is that at Otira, over five miles long; and the Mont d'Or Tunnel between France and Switzerland piercing the Jura Mountains is nearly four miles long.

A remarkable tunnel in America, opened in 1909, carries the Gunnison River through a range of mountains into the Uncompaghe Valley, which it irrigates. Hitherto, this area in south-western Colorado was an arid desert, but now it is a flourishing garden.

There are several long tunnels used for carrying water or drainage, but these are not very great in diameter. The Rothschoenberg Tunnel in Saxony, for instance, which drains the Felberg mines is over 31 miles long. It was opened in 1877. The tunnel which carries water to the Croton Aqueduct for New York City is over 33 miles long.

At Stiavnica in Czecho-Slovakia, formerly known as Schemnitz, there is a tunnel over 11 miles long in connection with the mines.

If the Channel Tunnel is ever constructed it will be the biggest tunnel ever made for passenger traffic, for it will be nearly thirty miles long. It was actually begun, and a whole mile excavated in 1882. Mr. Gladstone visited the works, but a few weeks later they were stopped by order of the Government.

Perhaps the most astonishing thing about these tunnels is the comparatively small amount of material dug out in making them. From the Alpine tunnels, for instance, only about a quarter of a million tons were excavated, seeming almost like a molehill compared with the 360 million tons dug away in making the Panama Canal.

Why is Coal the Best Thing for Making a Fire?

We ought not to say that coal is quite the best of all possible things to burn for making heat. The best fuel is really hydrogen; in other words, we get more heat by burning a given quantity of hydrogen than by burning the same quantity of any other substance that we know. That is why we burn a mixture of oxygen and hydrogen when we want to heat a piece of lime to make the light in a magic lantern. The objection to using hydrogen is the great expense.

The advantages of coal are its cheapness, its dryness, and especially the fact that such a large proportion of it

is burnable. Coal itself contains hydrogen, and is good so far; but the carbon of which it mainly consists is itself a fuel which is scarcely inferior to hydrogen, and as there is practically no water in coal (except, of course, the water that is made when the hydrogen of it is burned) we benefit by the heat that is made; whereas, if the coal had had a good deal of water inside it, that water would catch up the heat, and we should lose it. All the same, the time is rapidly approaching when we shall produce heat in better ways than the burning of crude coal in open grates.

What is the Elysée in Paris?

The Elysée in Paris is the residence of the President of the Republic. Probably it owes its name to the Champs Elysées, the famous Paris promenade on which its gardens open.

Built two hundred years ago by Molet for the Count of Evreux, the Elysée belonged to Madame de Pompadour, a favourite of King Louis the Fifteenth, but after the Revolution of 1789 the Palace became national property. Napoleon lived there before he moved to the Tuileries as the Emperor Napoleon, and there also he signed his second abdication in 1815. Later the Elysée was turned into a residence for foreign guests, till the government ended by giving it to the President for his term of office.

What is the Rosetta Stone?

During Napoleon's expedition to Egypt one of his officers discovered at Rosetta a black basalt slab covered with ancient writings. Two years later, when the British took Alexandria in 1801, among the things they captured was this stone, the famous Rosetta Stone now in the British Museum. It records a priestly decree of Memphis in 196 B.C. in honour of Ptolemy Epiphanes, but its great importance lies in the fact that it bears three versions of the same inscription, in hieroglyphic, demotic, and Greek script. Up to its discovery no one had been able to decipher the ancient Egyptian hieroglyphic or picture writing, but by comparing the unknown hieroglyphic version with the known Greek and demotic versions on the slab the secret of the picture writing was at last made clear. The chief honour for the deciphering of the inscription belongs to the famous Frenchman Champollion, the founder of the branch of study known as Egyptology. Demotic script was the popular method of writing.

Does Water Travel with the Waves ?

When we are on the seashore we see the waves continually beating on the beach. When we look out to sea the water seems to be in continual motion toward us, travelling in waves. Does the water actually travel? It is very important to understand the answer to this question, because it affects so many things.

As a matter of fact, water does not travel with the waves. The wave which moves across the sea is really a transference of motion, not of water. It is easy to set up waves for ourselves in a still pond.

Suppose we go to the shore of the pond and throw a big stone into the middle of it. The impact of the stone sets up motion at the point it strikes, and the motion is passed on from particle to particle of water throughout the pond until the edge of the water is caused to strike the bank, that stroke being really a transference of the blow given to the water by the stone. The pulsing of the energy through the water causes a series of waves, which we see formed in concentric circles round the spot struck by the stone.

Waves in the air are of just the same character. Drop a stone on the pavement and waves are formed in the air, the pulsation reaching our ears, knocking on their drums, and causing us to hear the sound of the falling stone. So with wireless. The little electric sparks made by a Leyden jar set up waves, not in the air, but in the ether of space, which affect a suitably tuned receiver, and form the secret of wireless telegraph and telephone.

What is Asbestos ?

The word asbestos comes from an ancient Greek word meaning unquenchable, and the valuable mineral of this name is so called from its great power of resisting heat. It is curiously silky and fibrous in appearance, and is obtained usually by crushing from certain rocks, the Canadian province of Quebec yielding by far the largest supply. Owing to its fibrous nature it can easily be woven into cloth or canvas, some of its chief uses being as a covering for machinery and for fire-proof gloves and clothes for furnacemen. In its unwoven state it is used as fire-proof putty, notably in gas fires. Asbestos was mined in Italy and Corsica in early times, and it is said that Charlemagne had an asbestos tablecloth which was cleaned by being thrown into the fire.

Did the Arabs Give us our Figures ?

The Hebrews, Phoenicians, and Greeks used the letters of their alphabet for numbers. Later the Romans, not an inventive people, adopted the same idea and selected seven letters (M, D, C, L, X, V, I) out of their own alphabet to make a system of figures. All the countries conquered by Rome copied in turn her use of figures. But this system was complicated. A number like 1923, for instance, required eight signs: MCMXXIII.

After the Christian nations of Europe came back from the Crusades they realised that the numerical system of the Arabs, which had been borrowed from the Hindus, was much better than that of the Romans. The number 1923, for example, was expressed by four letters instead of eight. So, from the twelfth century onwards the old system was abandoned. But there was no Arab sign for nought. The Arabs left an empty space or put a dot instead.

Why Can we not Fly Like Birds ?

The more we study living creatures the more must we marvel at the way they are adapted to their mode of life. If a creature is meant to fly, every part of it is adapted to that purpose. The bird's body is as light as it can be; it has large lungs to fill with air, and air-spaces in its body besides. It even has air in its bones to make them lighter. The shape of its body, sharp in front and gently curved, is suited for flight. Its feathers are perfect for their purpose, and are beautifully oiled so that water cannot stick to them, for if it did it would weigh the bird down. The muscles made for flying are enormous in proportion to the size and weight of the whole bird, and they are so arranged in relation to the wings as to give the greatest possible power. The legs are of no use in flight, and are therefore made as small and light as possible.

Human beings are not meant to fly, but to walk and run. We have neither feathers like the bird, nor long fingers with a membrane stretched between them like the bat. As we are meant to walk we have strong legs; the muscles of our arms are very weak compared with the corresponding muscles of the bird's wings; the shape of our bodies is not at all suited for flight, and so on. Our intelligence may make us machines for flying with, but it cannot alter the fact that our bodies are not adapted for flight, and can never fly.

Does a Strong Wind Slow Down a Steamship ?

A powerful wind blowing directly on the bows of a steamship does not necessarily lessen the vessel's speed. According to the captain of an Atlantic liner who has had a wide experience of gales at sea, a ship steaming in the teeth of a powerful gale is often able to go at a greater speed than it could do in a calm or in a light wind. The powerful wind causes more air to pass down into the stoke-hole, and this means that there is more oxygen for the furnaces. It is oxygen gas that causes the fire to burn ; and when the supply of oxygen is increased the fire burns more fiercely because there is more perfect combustion of the coal, the heat is intensified, there is increased production of steam, and consequently more power is being produced to drive the vessel forward. This increase of power more than overcomes any additional resistance set up by the gale, and the vessel's speed, so far from being lessened, is accelerated. Further, according to the Atlantic captain, where men are employed for stoking, the increased supply of air in the stoke-hole improves the breathing of the stokers, and this causes them unconsciously to increase their rate of work, so that the furnaces are better fed with fuel.

What is Phaethon's Chariot ?

In the story of the Old World gods it is told that during his exile on Earth, Apollo had become the father of Phaethon, a very gifted child. Phaethon was handsome, kind, and witty, but he was pompous and vain, so that his companions scoffed at his pride. "After all (they said) your mother is a mortal—and how do we know you are the son of a god ?" At this Phaethon fell into a passion, and, declaring he would prove to them his celestial origin, he set out for the mountains which led to the Palace of the Sun. In that dazzling abode Apollo sat on his glittering throne ; columns of gold and diamonds shone around him, and Days, Months, Years, Seasons, attended him in all their glory.

Phaethon having presented his prayer to the king, Apollo declared : "I am ready to grant you anything, my son. Speak, and I swear by the Styx that your prayer shall not be in vain." The bold young man asked that he might drive the Chariot of the Sun for one day ! "Unfortunate youth !" replied Apollo, "know

you what it means ? Know you the abysses on the way, the monsters lying in the path, watching across the sky ? How will you keep up with the motion of the Earth revolving down below ? How will you master the horses breathing fire ? Believe me, child," he continued, "you will ruin yourself by your ambition, and all the world may perish through your pride. Ask more wisely."

But nothing could shake the eagerness of Phaethon, and Apollo, having sworn by the Styx, had no choice but to keep his word. He led his son to the blazing chariot. Phaethon, so mad with joy that he hardly listened to his father's warnings, seized the reins while the Hours opened the doors of Day before him.

The steeds went steadily on, not aware as yet that the hand of a novice guided them. Besides, the way was yet easy. The young driver was filled with delight at the progress that he was making. But, instead of holding up his steeds the impatient Phaethon excited them on, until they turned aside and threw themselves madly among the stars. In an instant they had leaped so close to Earth that the green fields were devoured by fire ; plants, oceans, rivers, were dried up ; volumes of smoke blinded the people ; and some races became black. Then the mad steeds rose so high that an icy cold invaded the globe below. The terrified Phaethon tried in vain to restrain them ; madly his steeds dashed on. Men on Earth had never lived through such a day. The astronomers, tired of consulting the instruments at their disposal, thought the world was at an end.

Now it was that Earth, seeing her fountains exhausted, her crops withered by fire, her fruits dead, her oceans dried up, complained to the King of Olympus, and Jupiter, granting her prayer, sent his thunderbolt and smote the poor mad Phaethon. His power fell from his hands ; his body fell into a river, dead, a victim to his ungovernable pride.

Why do Men Talk of Burying the Hatchet ?

The North American Indians, when they made peace, signalled the event by burying their tomahawks, or war hatchets. With great ceremony, when war broke out again, they dug their tomahawks up. So today when people make up their quarrels, even if they have never seen a tomahawk they talk of burying the hatchet.

Can a River Flow Uphill?

Certainly it cannot in the ordinary way though it is often said that the Mississippi flows uphill, because, as the Earth has a less diameter from north to south than from east to west, there is something like a bulge as we get near the Equator, and the Mississippi, running from north to south, has to flow up this bulge, as it were. But, though a river will not flow uphill unaided, the water can be made to raise itself twenty or thirty feet or more without any other motive power than the downward flow of the river. Of course this is not perpetual motion, but it is something like it.

The apparatus which enables the river to perform this seeming impossibility is known as the hydrautomat, and is the invention of Mr. T. G. Allen, a well-known engineer. It is in practical operation on the River Wandle at Carshalton, near London, and its method of working is shown in the picture-diagrams on page 6600. For its action it depends entirely on two natural sources of energy, the weight of a column of water and atmospheric pressure. By these means a stream of water is compelled to hoist up part of itself to a higher level. All that is needed is a river that has a certain fall of water from a higher to a lower level; and between these two levels an operating chamber is constructed into which water flows through a supply pipe from the upper level, and from which it runs away to the lower level. In doing so, by an ingenious use of a vacuum and compressed air, a certain proportion of the river's water is raised to a tank many feet high, in the way shown in the pictures.

Why Can some Animals do Without Food for a Very Long Time?

They can fast for long periods and yet suffer no permanent harm because they are resting, and are living on their reserves. A very good example of this is to be seen in our common snakes, which, after feeding heartily during the summer months, retire into their winter quarters, where they take no food at all. The reason for their being able to do this is that during the months of feeding they are enabled to store up in the body a large quantity of fat (which represents the excess of the food taken) over what was required at the time. This fat can be used by the body itself while the animal is not actually eating; it is gradually absorbed, or used

up. So we find that a snake which was round and fat at the end of the summer is extremely thin when it comes out of its winter quarters in the spring.

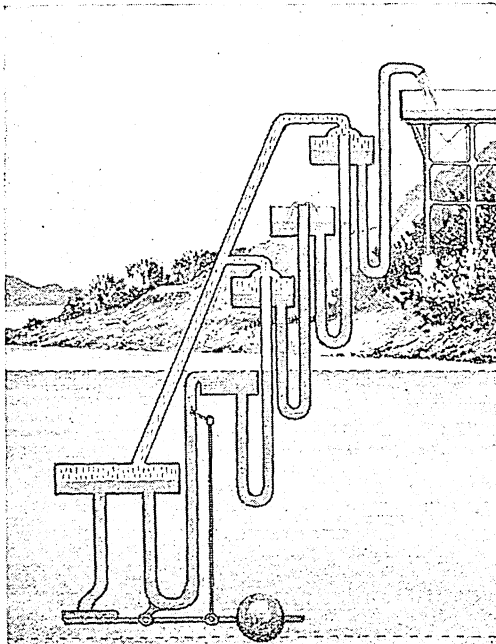
Does an Outside Horse on a Roundabout Move Faster than the Others?

Certainly it does. It is in the same position as the outside boy or girl in drill-games in the gynnasium, when you form lines like the spokes of a wheel. The children near the centre almost mark time, while those on the outside may have to run. So with a sling. You put the stone at the end of the sling because when you swing it a slow movement of your hand means a quick movement of the sling. The farther the sling is from your hand the quicker it goes, and the quicker the stone is moving at the moment it leaves the sling the farther it will fly. So with a hammer. The longer the handle, the greater its power. If you had a hammer with several heads on the handle, the end head would do most work, because, like the outside horse on the roundabout, it will move more quickly than the others, and its power is due to its weight *and its movement*. You will be able to think of other examples of this for yourself. What about something on the rim of a wheel, for instance, compared with something near the axle? Any point on the rim or tyre, of course, travels more quickly than the axle.

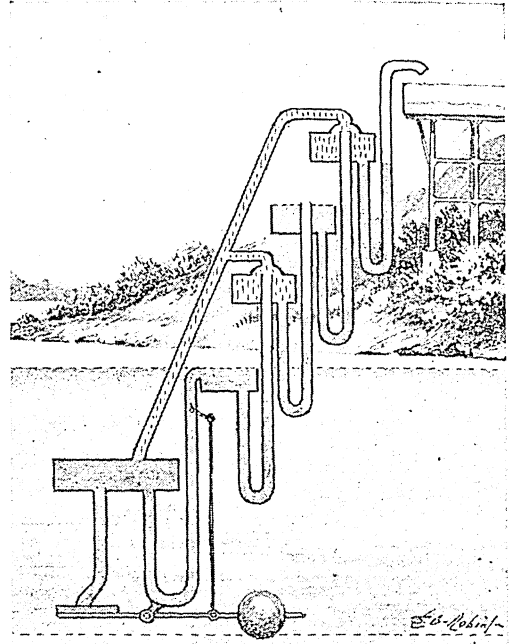
Why Can't a Baby Talk When it is Born?

There are many reasons. One is that the baby needs a lot of practice before it can get control over the muscles of its lips and throat and tongue, so as to speak. Another reason why a baby cannot talk is that the part of its brain by which talking is done is not developed when a child is born—neither the part which hears sounds, nor the part which reproduces those sounds. But the chief reason is that language depends entirely on imitation. We learn to speak by imitating the sounds we hear, and the baby cannot do this until it hears them, and then learns to distinguish them. The more we study talking, the more wonderful we find it. There is nothing more marvellous in the world, though it is so common, than to watch a baby or a child learning to speak. If a human being, after being looked after for a little while, were left to live by himself, he could talk, but would only scream, or grunt, or point to things.

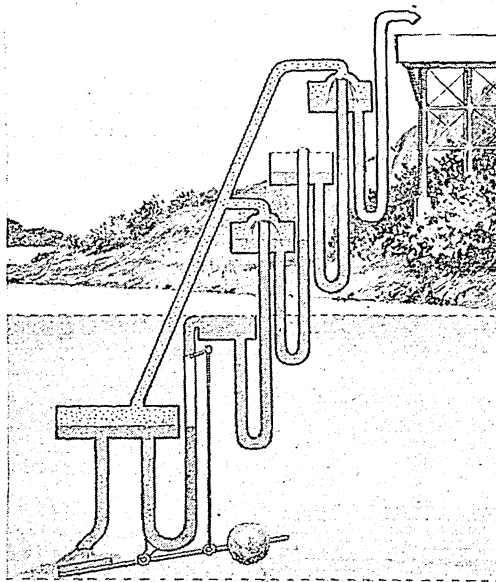
HOW A RIVER RUNS UPHILL



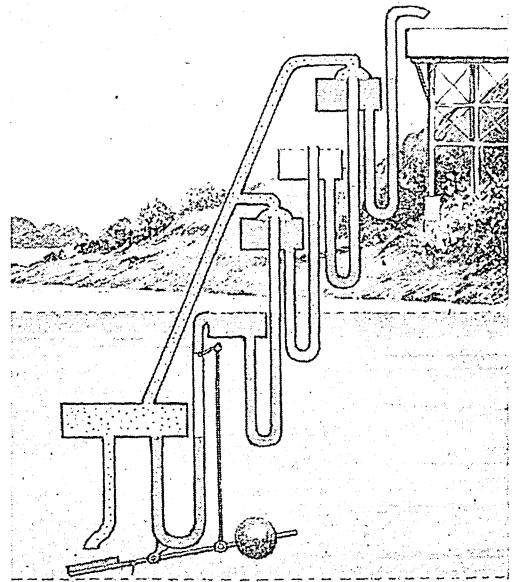
1. At Carshalton the River Wandle is made to raise itself by this apparatus called a hydrautomat. It consists of an operating chamber at the bottom, and a series of tanks alternately opened and closed and connected with pipes. An air-pipe also links them all. Water is here shown running into the operating chamber from the river, compressing the air and forcing it through the air-pipe to the closed overhead tanks.



2. The closed overhead tanks are full of water at the beginning of the operation, but the pressure of the air from the operating chamber forces the water out of the closed tanks, and in each case it passes through a bent outlet pipe into the tank immediately above. At the close of the operation, therefore, as shown here, the operating chamber and the open tanks are full of water and the closed tanks are full of air.



3. The operating chamber now discharges its water into the river, and in doing so automatically closes, by a simple lever mechanism, the inlet into the chamber from the river. When the water has all run out at the lower level, practically a vacuum is left, which extends by the air-pipe to the various closed tanks above.



4. The vacuum in the closed tanks causes the water to be sucked up one flight from the open tanks below, and at the end of the movement the operating chamber and the open tanks are empty of water, while the closed tanks are full. The inlet from the river then automatically opens, and the operation is repeated.

WATER RAISING ITSELF TO A HEIGHT



Two different patterns of the hydrautomat, which enables a flowing river to raise its water to a height of thirty feet or more. The series of tanks may be arranged one above another as shown here, or they may be in the form of steps.

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Does the Sun Put Out a Fire ?

The Sun cannot put out a fire because it cannot bring to it anything which would cool the burning material, but in the bright sunlight the fire will appear less glowing to the eye than when its surroundings are in shadow. Just in the same way a lighted match, if struck in the sunlight, compares so poorly with the brilliance of the Sun's beams that we can barely see if the match is lit or not. Another way of looking at the matter is that when the Sun's rays are not on the fire all the red glow is radiated. But when the sunlight shines on the burning coals the black parts of them absorb it and the other parts reflect it, so that the red radiation appears less brightly red because mixed with reflected sunlight. That is all that happens so far as the light is concerned, but on sunny days there is also often a down draught in the chimney so that the fire in a grate suffers from a want of air:

What Makes us Grow ?

We cannot fully explain growth, because growth depends on life, and we cannot fully explain life ; but there are certain laws which we know. The first is that, to begin with, our food makes us grow ; this is true of all growth everywhere, whether of a cabbage or a child. Growth is, among other things, the addition of new material to the body. Now, though life is so marvellous, it obeys the laws of Nature, and we have proved that all living things obey the law that matter cannot be made out of nothing. Therefore, the new matter added to itself by the living body is derived from the food ; and that is why the feeding of living creatures while they are still growing is so very important.

This sounds as if we understood the whole of growth, but that is far from the truth. For in the case of every human being, or every animal, there comes a time when no amount of food will cause growth. There are laws inside the living body which decide when it shall stop growing, and a man of thirty will never get any taller, however much he eats. Even a tree, though it may get thicker as long as it lives, will not grow taller after a time. *Real* growth is only the outward visible sign of development, as when an acorn develops into an oak ; and the causes of development still lie hidden deep in the mystery of life.

Where Do the Flowers Go in Winter ?

The flowers of most plants can only live and be useful for part of one year, when there is plenty of light and warmth. When the summer goes they die. You know how the roses on a rosebush die, but you know also that the rosebush itself does not die.

In just the same way the leaves of most trees die at the end of the summer, but the trees go on living. When the flowers and the leaves die and fall, their death is really a sign of life in the plant, or bush, or tree that bears them. If the whole bough of a tree is killed by something in the summer, the leaves will remain on it when the leaves of all the living boughs have fallen. There is really no waste or loss to a plant or a tree when its leaves and flowers die.

Before a leaf falls it changes its colour, as we know, because the plant or tree is taking out of the leaf all the useful things that it needs for its own life. Then, at the base of the leaf, it forms a thin layer of something rather like cork, so that, after some of the useful things have been taken out of it, the leaf is left to die. There are still some useful things in the leaf, however, only they need something to be done to them before the plant can use them.

What is a Palimpsest ?

Palimpsest comes from two Greek words meaning again and scratched out, and a palimpsest is a manuscript on parchment or paper on which the original writing has been scratched out or wiped out with a damp sponge to provide a fresh writing surface. The scraping of parchment, already practised by the ancients, became customary after the seventh century, when Omar, the great Moslem chief, destroyed the Egyptian papyrus factories. It only stopped with the invention of paper. In spite of its thinness some papyrus also was often scraped, so that many old manuscripts thus disappeared. However, it was discovered that in some of them the ancient script could be read under the new, and this led to another study, that of reading the writing underneath, a study made successful by the help of modern chemicals. Sometimes two and three writings have been deciphered under the most recent writing on the parchment. Portions both of ancient classical books and of the Christian Scriptures have been recovered by the examination and treatment of palimpsests.

What Makes us Sneeze ?

Usually we sneeze because there is something in our nose that should not be there. The nose is the proper channel for the air we live by, and our brain is made so that when anything interferes with this channel it makes us breathe out violently through the nose, and that is a sneeze. The inside of the nose must be ready to feel the least thing so as to tell the brain what is wanted. Of course, it is not we ourselves who do this, but the unthinking part of our brain; and as it cannot always tell whether sneezing is needed or not it often makes us sneeze when the blast of air through the nose has nothing to clear away, and the only trouble is a little irritation. We sneeze at pepper because it irritates the inside of the nose. One kind of sneezing is due to something in the way the nerves of the brain are connected, and is not a bit of use, and that is sneezing at a bright light, usually the sun. To blink at the sun is sensible, for that protects the eyes, but there is no sense in sneezing at it. You can almost always stop a sneeze when you feel it coming, by pressing on the nose, especially on each side, about half-way down, just where the bone stops. There is a little nerve here which, when it is pressed, tells the brain to go no farther.

Why Does Not the Moon Make Waves on Rivers as Well as on Sea ?

The Moon does not exactly make the waves of the sea, but it draws the sea after it as the Earth spins, and as the sea usually moves in waves, due to the wind, so the tides rise and fall in waves. This is a wise question, for we might think that the water of a river ought to behave as the water of the sea does, and there is no doubt that water everywhere, and every liquid surface, and even the solid crust of the Earth, are affected by the Moon. But the sea is deep, and so there is enough water to be heaped up under the pull of the Moon, and to make visible tides. The water of a river is very shallow in comparison with the sea, but near the mouth of most rivers, where they communicate freely with the sea, the great tidal stream of water flows up and down the river as the tide flows and ebbs; and so the influence of the tides can be seen in these tidal rivers, perhaps many miles up from the sea. Thus, the tides can be noticed in the Thames in London.

What Makes Our Eyes Blink ?

The real object of the blinking of our eyelid is to keep the front of the eyeball clean. The blinking itself is done by means of muscles in the eyelids, and the cleaning is done by our tears. That is what tears are for. The fluid we call tears is secreted in a little gland and carried along to the eye, and when our eyelids move up and down this fluid is poured over the front of the eye, and washes away any particles of dust or other irritating substance that may be present. Some animals—snakes, for example—have no eyelids, and therefore never blink, and in these creatures there is a hard film, or scale, over the eye to protect it from injury and dirt.

What is the Oath of Hippocrates ?

Hippocrates was a physician of ancient Greece, who acquired such widespread fame that he has been called the Father of Medicine. He put aside all such superstitions as the use of charms, and sought to find scientifically the causes of disease, and alleviations and remedies that were according to Nature. He and his students left records of many cases that have a permanent interest. Round his writings, as time went on, accumulated many similar writings and records that are now called The Hippocratic Collection, and number more than eighty documents. Hippocrates belonged to what we should now call a medical guild or profession, and for those who joined it an Oath was drawn up that was solemnly sworn and observed. The general belief is that Hippocrates wrote the Oath, which is translated as follows in a recent volume of the Loeb Library :

I will look upon him who has taught me this art even as those who bore me; I will share with him my substance, and supply his necessities if need be; I will regard his offspring as my own brethren, and I will teach them this art, if they desire to learn it, without fee or stipulation.

I will impart it by precept, by lecture, and by all other modes of instruction to my own sons, to the sons of him who taught me, and to disciples bound by covenant and oath according to the law of the physicians, but to no other.

The treatment I adopt shall be for the benefit of my patients, according to my ability and judgement, and not for their injury nor for any evil purpose. I will not give a deadly drug to anyone, though it be asked of me, nor will I lead the way in such counsel. I will keep my life and my art pure and holy.

Whatsoever house I enter, there will I go for the benefit of the sick, refraining from all wrongdoing and corruption. Whatsoever I see or hear concerning the life of men, in my attendance on the sick or even apart therefrom, which ought not to be spoken of abroad, I will keep silence thereon, counting the secrecy of such things to be sacred.

If I fulfil this oath and break it not, be it mine to enjoy life and art alike, with good repute among all men for all time. If I transgress it and forswear myself may the contrary befall me.

It is interesting to note how almost universally the honour of the medical profession has been sustained as defined by Hippocrates, from the dim past of ancient Greece to the present day.

What Makes us Yawn?

We yawn when we are tired, or sleepy, or bored. In all these states the truth is that we are not breathing as deeply as we should, and our blood has not got enough air—or, rather, enough oxygen from the air—in it. There is a tiny but precious speck of nerve stuff in our brains which looks after our breathing, and it is very sensitive to changes in the blood, when these mean that something is not quite right. When it finds that there is not enough oxygen in the blood—and it seems to find this out suddenly—it gives an order for a deep breath that shall put things right.

That is the reason why we yawn, for a yawn is simply a sudden deep breath inwards, as a sneeze is simply a sudden deep breath outwards. When people are not quite well they sometimes yawn all day, and this is not a good sign, for it means that their breathing is not doing its work properly, and that these repeated efforts to catch up with the need for air have become necessary.

Is a Wise Man's Brain Bigger Than a Stupid Man's?

It is often thought that a clever man's brain is bigger than a stupid man's, and it is certainly true that the higher and cleverer races of mankind have larger brains, on the average, than the lower races. But if we go more into detail than this we soon meet with difficulties.

Among people of the same race a very clever man may have a brain really smaller and lighter than that of a stupid man. This has long been a great puzzle, but it can now be explained.

To weigh and measure the whole brain is a mistake, and cannot prove much. It is not the whole brain that counts. For instance, there are open spaces inside all brains, and in different people these differ in size and in the weight of what they contain. Also, the amount of what may be called packing in the brain seems to vary in different people.

The things that really count are the nerve-cells found in the grey layer on the surface of the brain. Where the brain is folded this grey matter dips into folds, and a small and much-folded brain may really have far more grey matter than a big and rather smooth brain. Also the grey matter varies in thickness in different people, and even in the same brain.

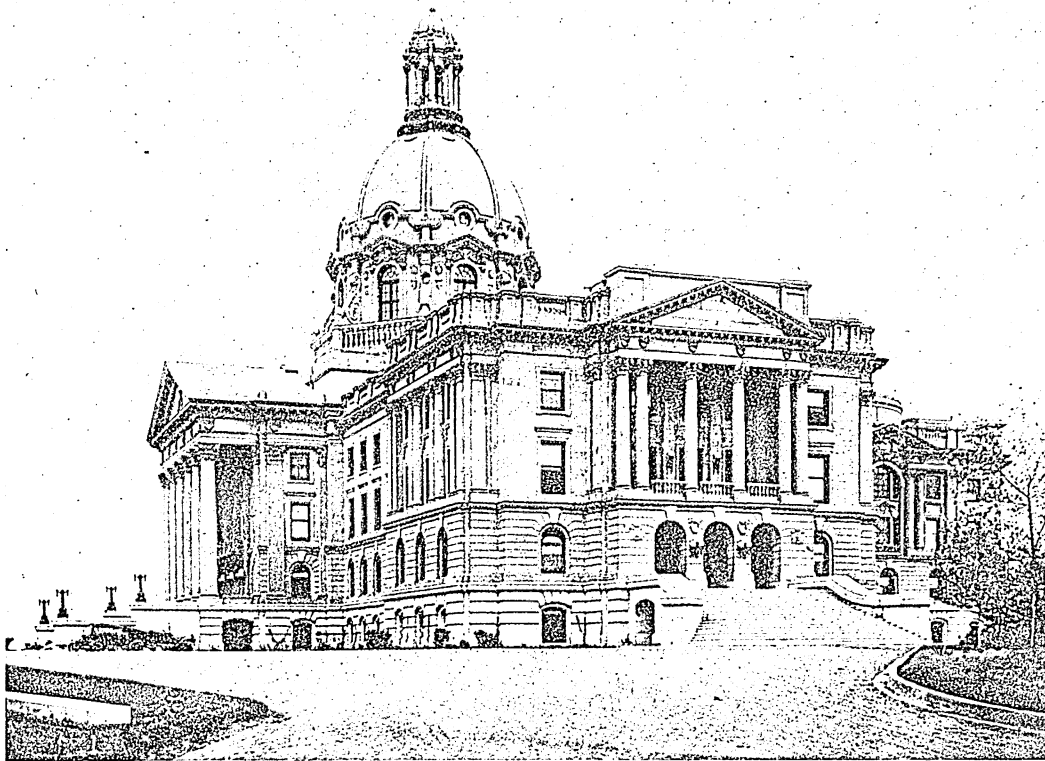
If it were possible to make the test by the real thing which counts, we should not have much difficulty in finding the connection between the size of the brain and the mind. In order to do this, however, we should really have to count the number of nerve-cells in each brain. Perhaps even then we might not be wholly at the end of our question, because it is very likely that one cell is not as good as another!

Do Parrots Know What They are Talking About?

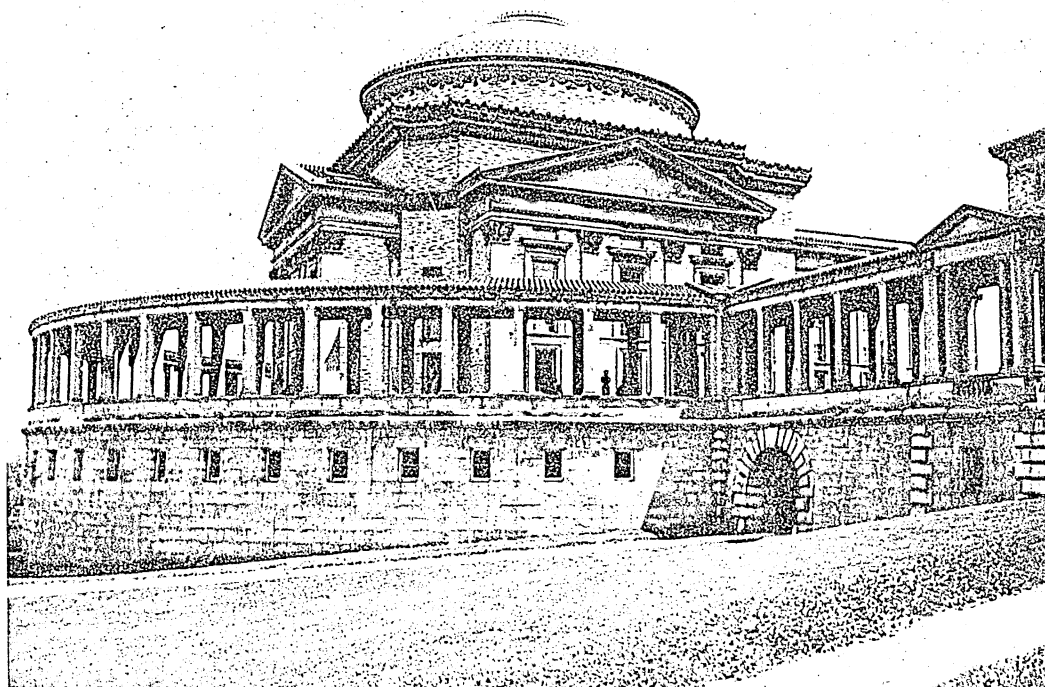
We believe that no parrot knows in the least what it is talking about. The parrot has keen ears and a clever brain, so that it hears very distinctly words uttered in its presence, and can reproduce with its throat and tongue and beak many of the sounds it so cleverly hears. Of course this is a very different thing from an echo, but so far as attaching any meaning to the sounds is concerned, parrot speech is only echo speech.

Small children reproduce words which they do not understand in just the same way, and grown-up people, also, sometimes. If we could believe that a parrot understood what it said we should have to put the parrot on something like our own level in the scale of being. But we find that all words are just the same to a parrot, and it will repeat a word like Algebra, if it hears it often enough, just as readily as it will say Pretty Polly. It is just a living echo and no more, and the process that goes on in the parrot's brain is no more and no less than what goes on in our brain when we imitate or repeat the sound of words spoken to us in some language of which we know nothing.

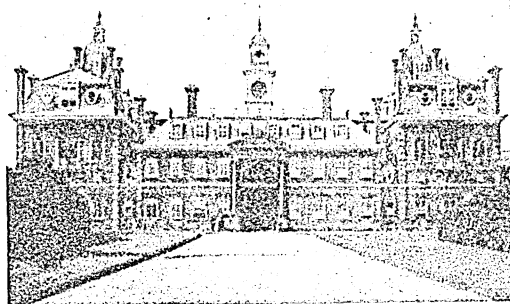
FAMOUS MODERN BUILDINGS



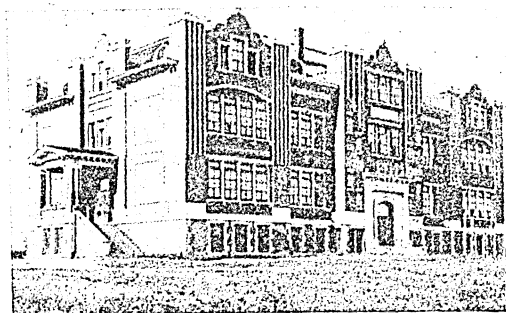
THE FINE PARLIAMENT BUILDINGS OF ALBERTA AT EDMONTON IN CANADA



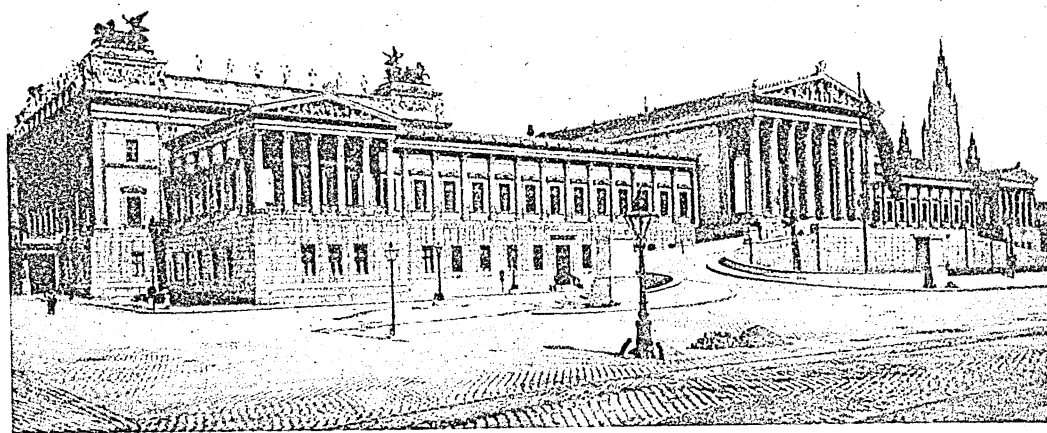
THE HALL OF FAME AT NEW YORK UNIVERSITY



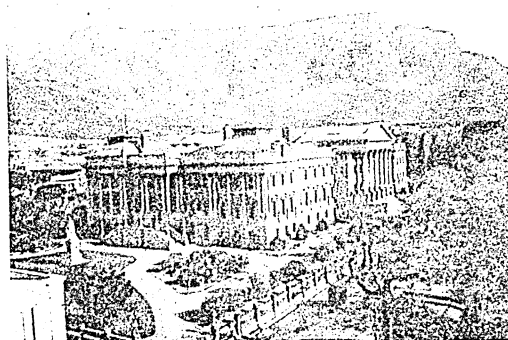
WELLINGTON COLLEGE IN BERKSHIRE



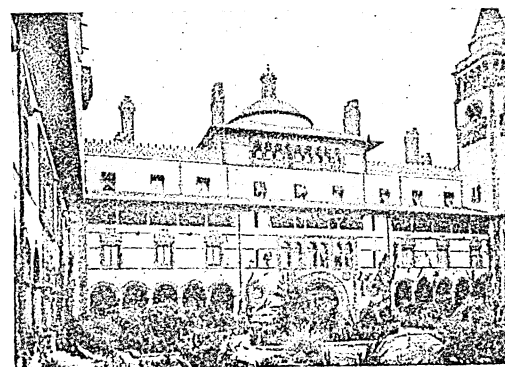
A COLLEGIATE SCHOOL IN SASKATCHEWAN



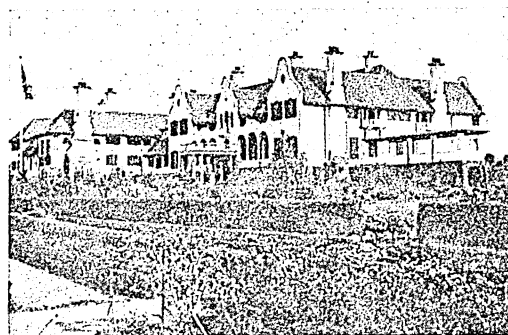
THE GREAT HOUSES OF PARLIAMENT IN VIENNA



PARLIAMENT HOUSE IN CAPE TOWN



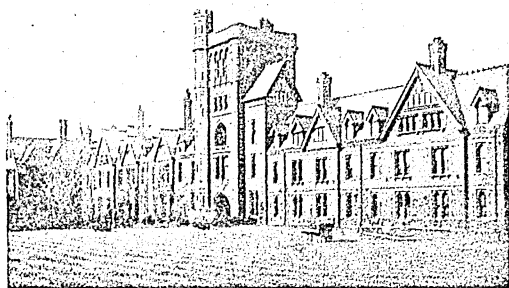
HOTEL COURTYARD AT ST. AUGUSTIN, FLORIDA



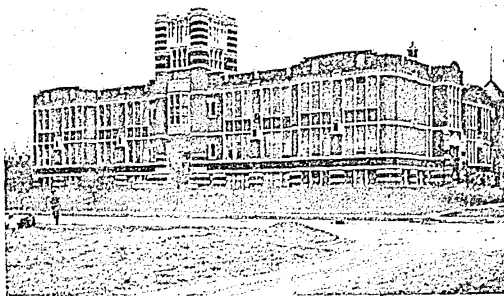
GOVERNMENT HOUSE AT PRETORIA, TRANSVAAL



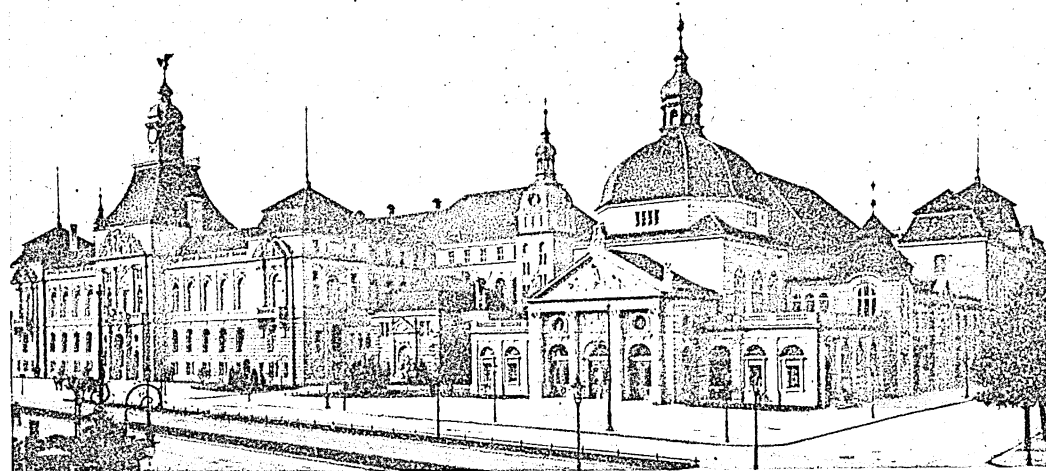
TRURO CATHEDRAL IN CORNWALL



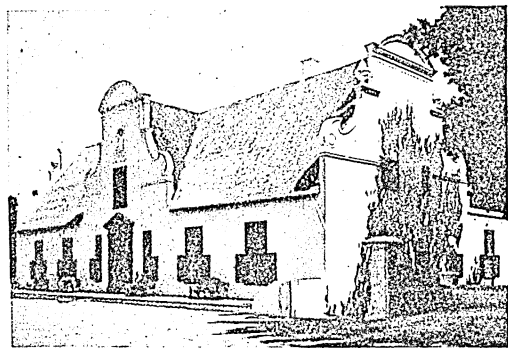
GIRTON COLLEGE AT CAMBRIDGE



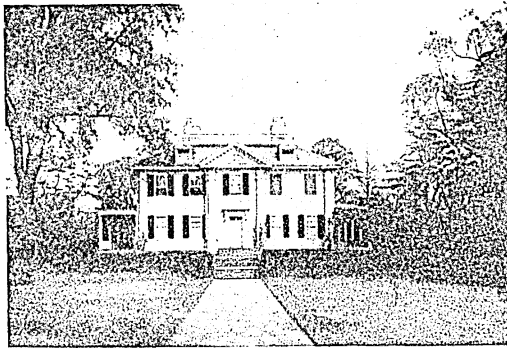
KING EDWARD SCHOOL, EDMONTON, ALBERTA



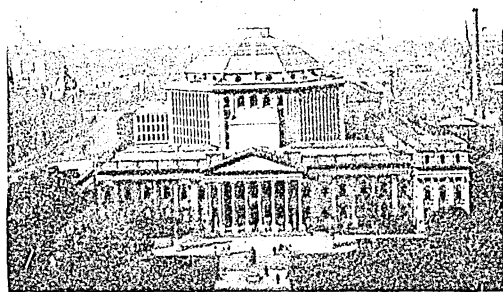
THE HIGH SCHOOL FOR ARTS AND MUSIC AT CHARLOTTENBURG, BERLIN



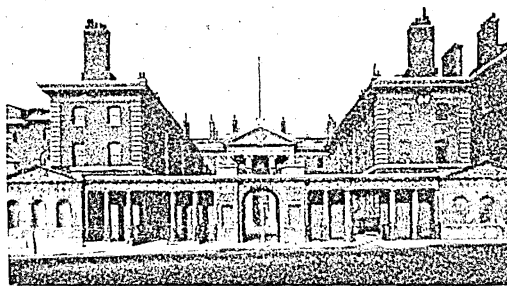
GROOT CONSTANTIA, AN OLD HOMESTEAD
IN CAPE PROVINCE



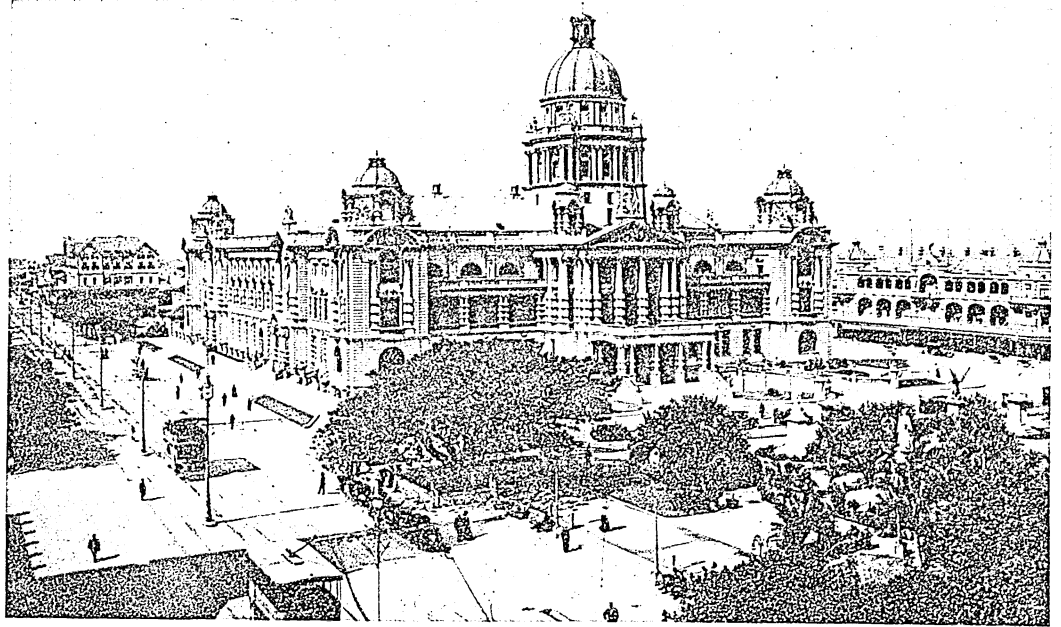
LONGFELLOW'S HOUSE AT CAMBRIDGE
IN MASSACHUSETTS



THE PUBLIC LIBRARY AT MELBOURNE, AUSTRALIA



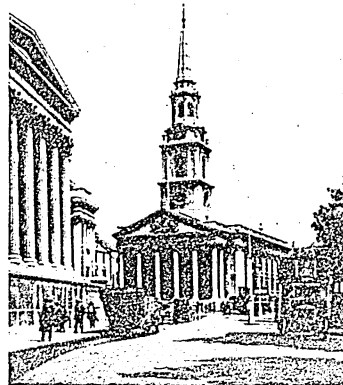
THE OLD ADMIRALTY IN WHITEHALL



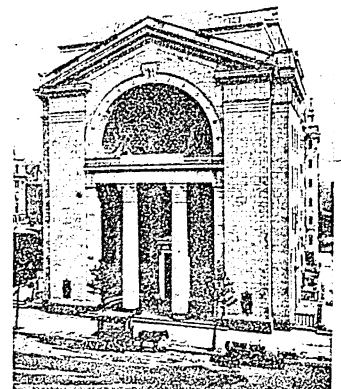
DURBAN TOWN HALL IN NATAL



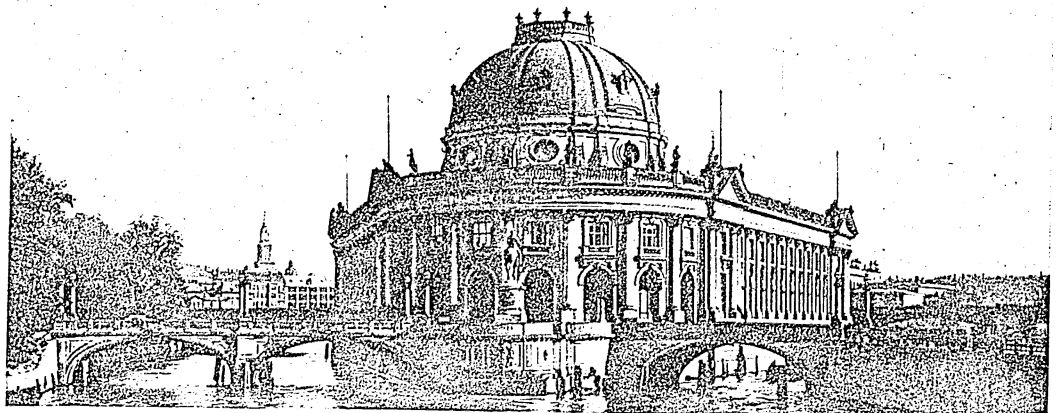
THE COMMONWEALTH BANK OF
AUSTRALIA IN SYDNEY



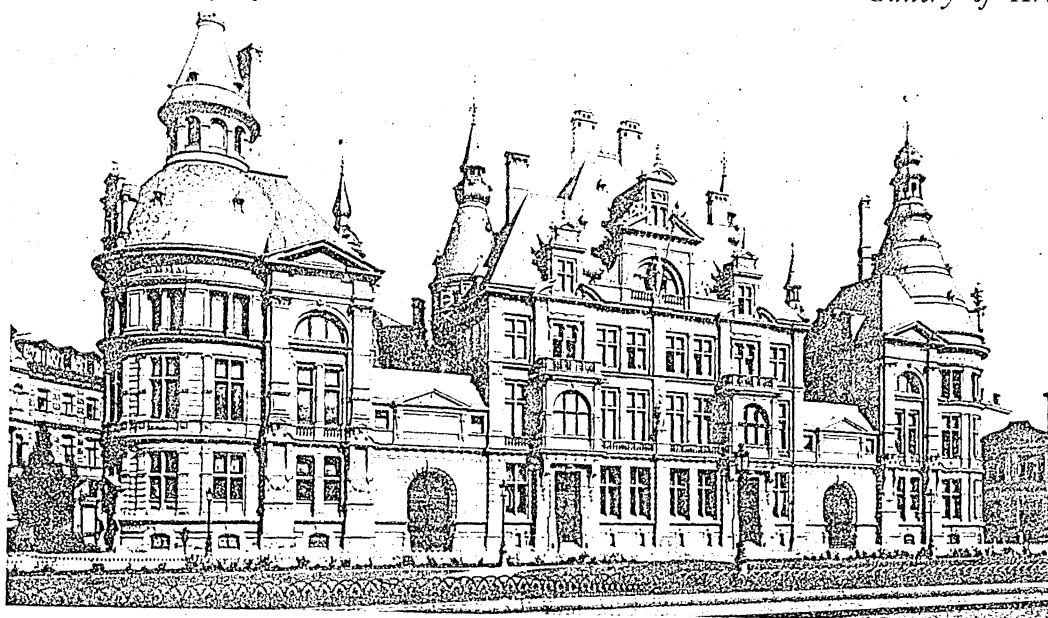
ST. MARTIN'S-IN-THE-FIELDS
LONDON



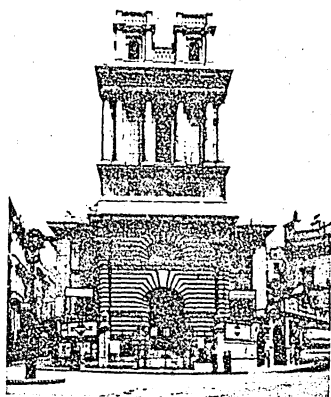
THE KINGSWAY FRONT OF
BUSH HOUSE, LONDON



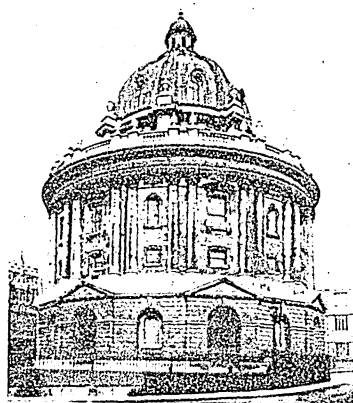
THE KAISER FRIEDRICH MUSEUM IN BERLIN



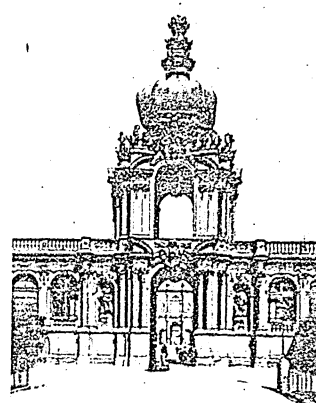
THE NATIONAL BANK AT ANTWERP.



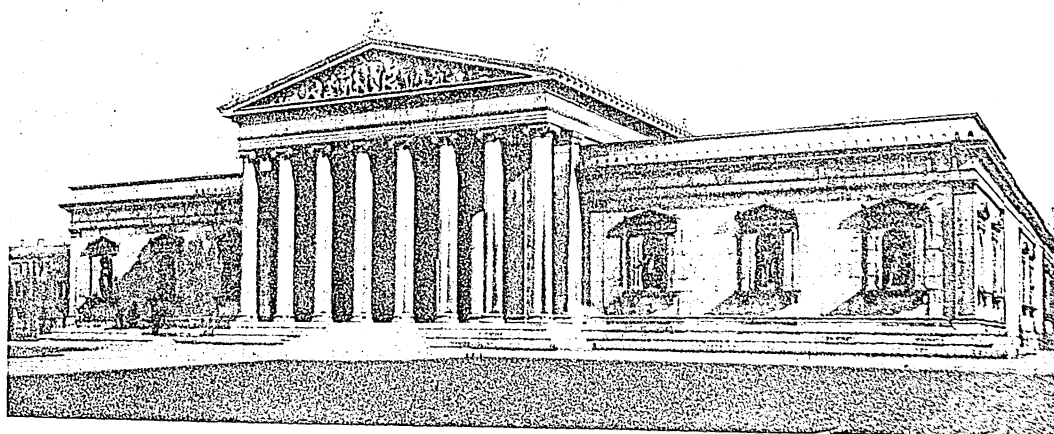
ST. MARY WOOLNOTH, LOMBARD STREET, LONDON



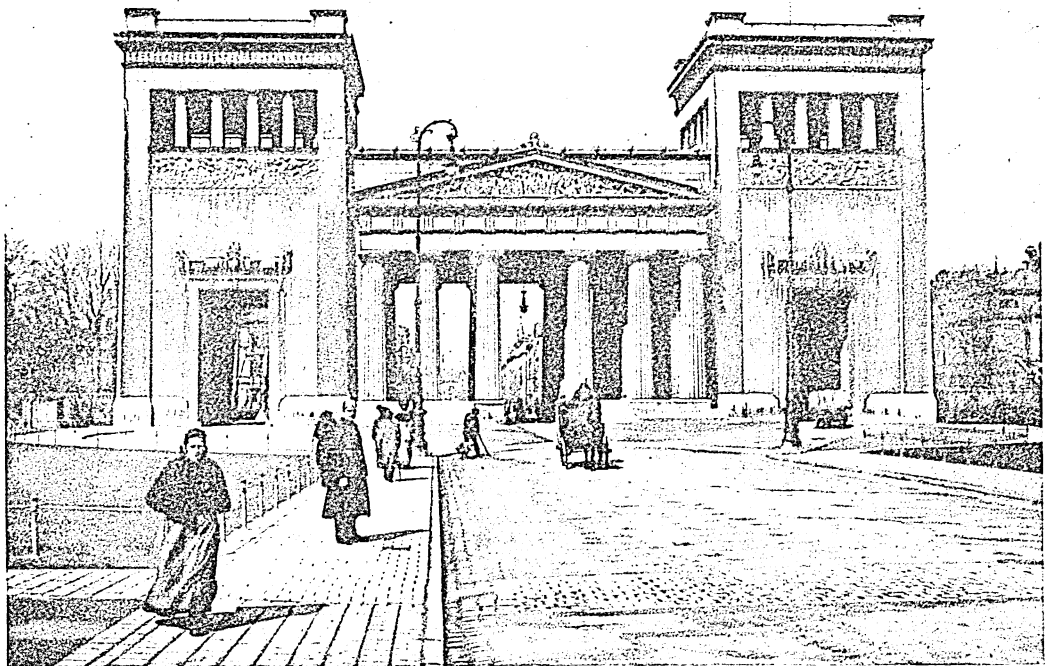
THE RADCLIFFE LIBRARY AT OXFORD



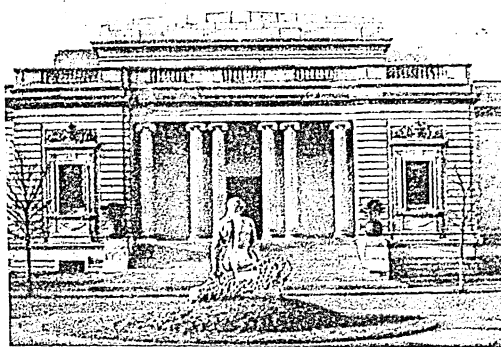
ENTRANCE TO THE ZWINGER MUSEUM AT DRESDEN



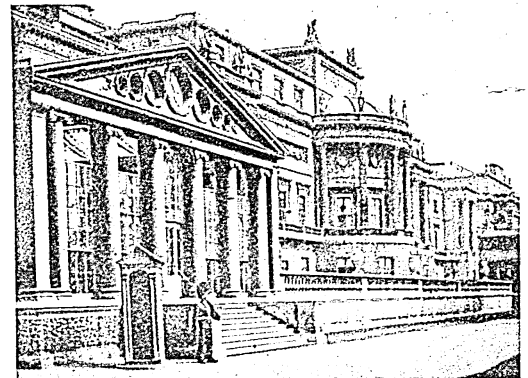
THE GLYPTOTHEK—THE SCULPTURE GALLERY AT MUNICH



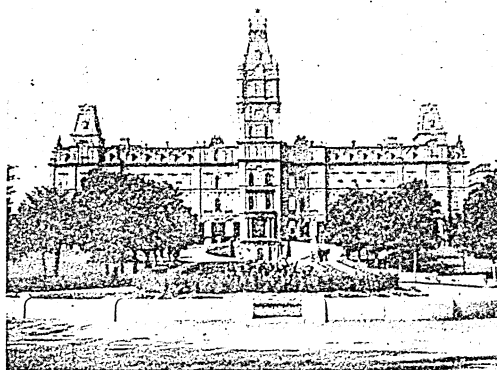
THE PROPYLAEA IN THE KÖNIGSPLATZ AT MUNICH



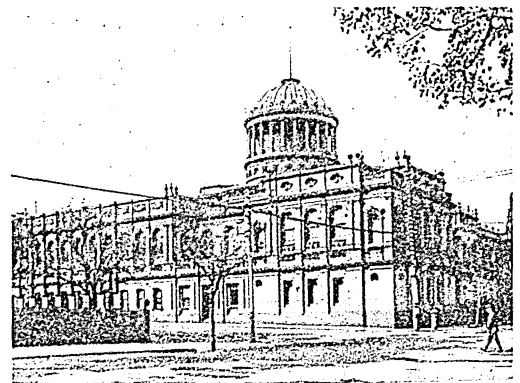
THE LADY LEVER ART GALLERY
AT PORT SUNLIGHT



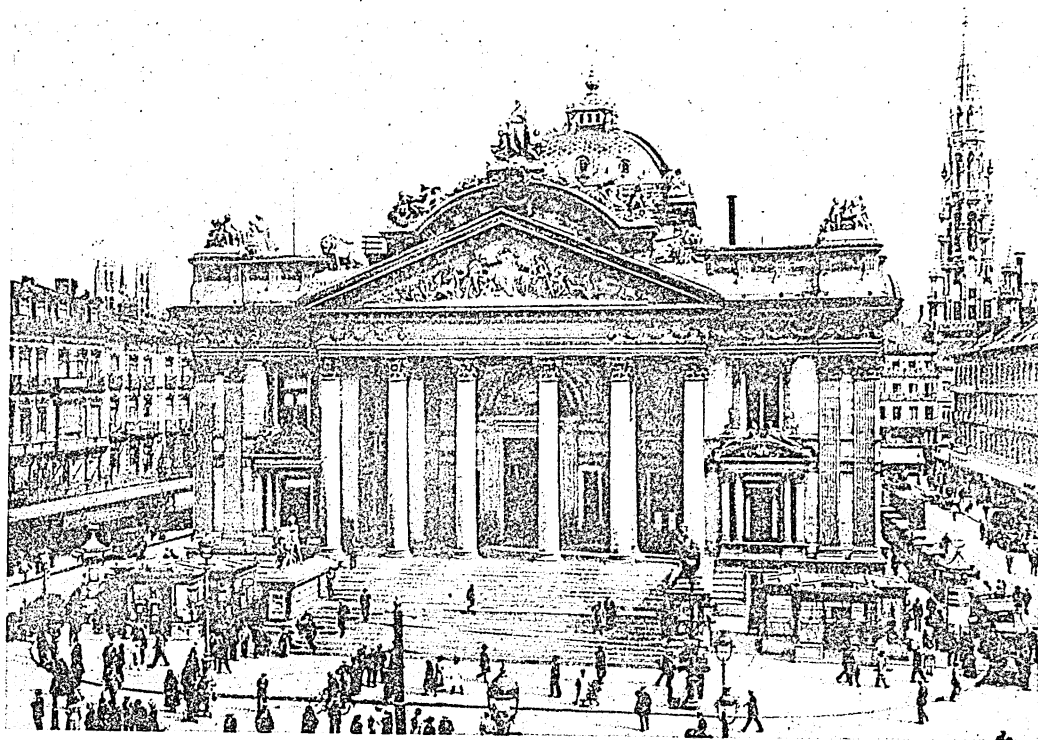
THE GARDEN FRONT OF
BUCKINGHAM PALACE



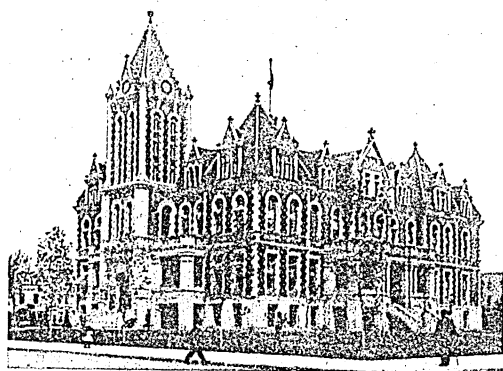
THE QUEBEC HOUSE OF PARLIAMENT



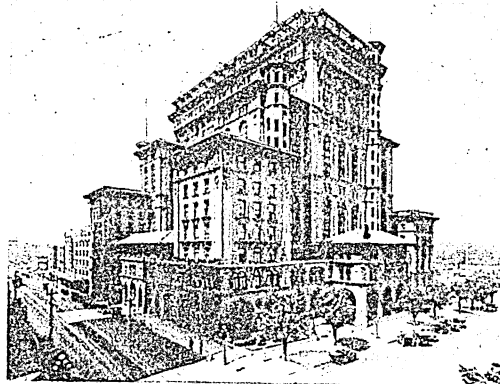
THE LAW COURTS IN MELBOURNE



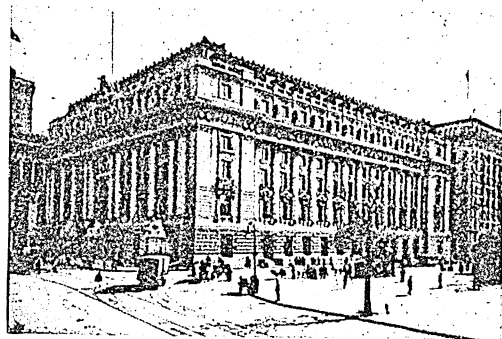
THE BOURSE IN BRUSSELS



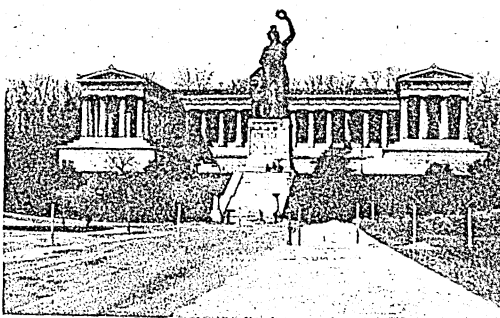
THE NEW CITY HALL AT REGINA
SASKATCHEWAN



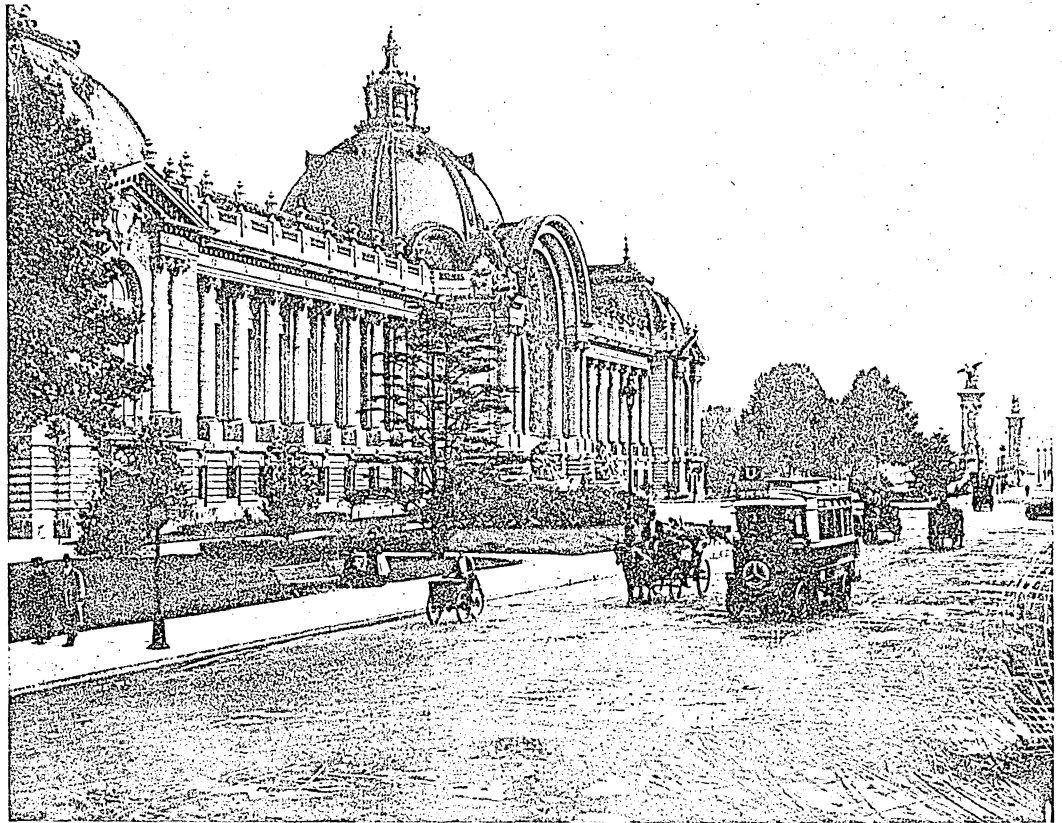
VANCOUVER HOTEL IN VANCOUVER
BRITISH COLUMBIA



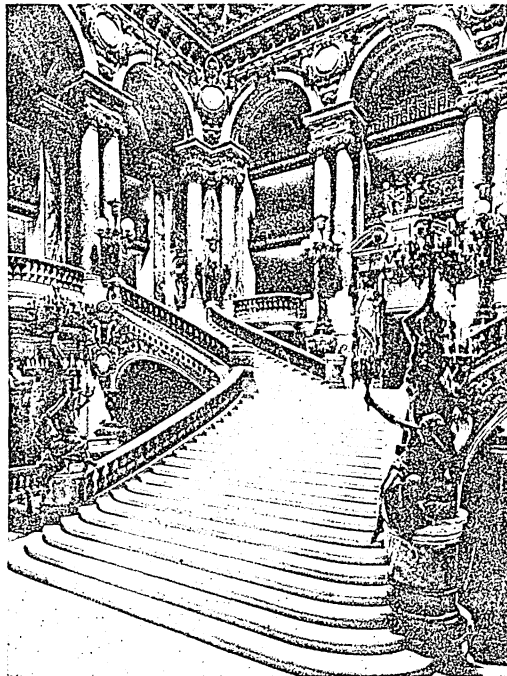
THE CUSTOM HOUSE, NEW YORK



THE HALL OF FAME AT MUNICH



THE PETIT PALAIS IN THE CHAMPS ELYSÉES, PARIS



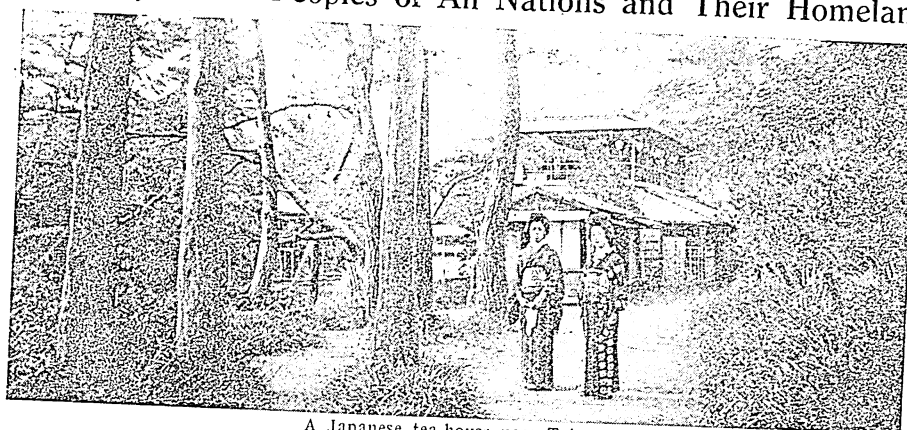
THE GRAND STAIRCASE OF THE
OPERA IN PARIS



THE GRAND STAIRCASE OF THE PALACE
OF JUSTICE IN BRUSSELS

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The Story of the Peoples of All Nations and Their Homelands



A Japanese tea-house near Tokyo

JAPAN AND ITS STORY

OFF the western shores of the great Eurasian continent, the continent formed by Europe and Asia, lies the compact little group of islands which form our British Homeland.

Off its opposite eastern shores, half-way round the world, lies another group of islands, a long chain of them, stretching from the tip of the huge, bare peninsula of Kamchatka to the tropical, half-civilised island of Formosa, off the coast of Central China. These islands form the Japanese Homeland, more than three times as large as our own land.

Japan (or Nippon, the country's own name) is often called the Britain of the Pacific, so many are the points in common between the two countries. Both are near enough to a great continent, the one on the west, the other on the east, to be strongly influenced by it; both are far enough away from it to develop a sturdy independence and a definite character; both have been kept apart from encroaching neighbours by protecting seas.

It is the call of the sea, the inviting readiness of its open paths, the stern discipline it gives to all who venture on it, that have fashioned the characters of Japanese and British alike. Both are nations of sailors and traders by long inheritance with foreign countries.

The Japanese often compare the shape of their country with that of a dragon-fly. Its body consists of the four chief islands that shut in the Sea of Japan; the two long feelers are Sakhalin (half of which belongs to Japan) and the Kurile Islands, which brush Kamchatka. The Lu-chu Islands and Formosa form a fine tail.

The part of the great continent nearest the body of Japan, the peninsula of Korea, which separates the shallow Yellow Sea from the deep Sea of Japan, has been finally incorporated in the Empire. Korea, the Land of the Morning Calm, is as large as Great Britain. Like Japan, it has a long history.

What is more beautiful and suggestive of unearthly visions than the sight of the blazing Sun rising from the sea, his beams making the waves look like molten gold, and tinting the wide sky above with every delightful and delicate shade of colour? The men of China have ever gazed eastwards on this glory, and their wise men wrote down in their oldest books wonderful stories of gods and heroes living in the islands hid in the gorgeous eastern ocean. And so Japan, this Land of the Rising Sun, came to be regarded as a mysterious and sacred country, and its people proudly claim descent from the shadowy great ones. The beliefs which grew up round the old

THE FIVE CONTINENTS & 100 NATIONS & RACES THAT INHABIT THEM

picturesque stories led, in course of time, to the national worship of unseen gods and spirits, of ancestors, and powers of Nature, which still has a strong hold in Japan. This religion is called Shintoism, a word meaning "the way of the gods."

THE PEOPLE OF OLD JAPAN WHO WERE EVER DRIVEN BACKWARD BY INVADERS

It is generally thought that after the Cave Dwellers the first people to settle in Japan were the Ainos, who came across the narrow sea from Siberia. A delightful change they must have found in these southern islands, with their pleasant and warm climate, and beautiful, fertile country. The climate on the east coasts of Japan is tempered by a warm stream from the south, just as the north-west coasts of Britain are washed by the warm Gulf Stream from across the Atlantic. The Ainos, however, were ever pushed back from the more desirable parts of the land by new-comers of higher civilisation. Some were of Mongol race, like the Chinese, and came from the neighbouring continent across the Sea of Japan, from Korea and Manchuria.

Other new-comers came from Southern Asia. These were of Malay race. Waves of these two races came time after time, and they are the true ancestors of the Japanese people, but the Ainos have never been driven right out of the country. There are still some thousands of them in North Japan, living apart from the other people. They are remarkable for their general hairiness.

They are a peaceable people, not caring for progress, but with many good qualities. They gain their living chiefly by fishing and hunting in the dense forests, which harbour wild animals and game, in the northern island of Yezo, or Hokkaido.

THE LINE OF EMPERORS WHO HAVE RULED FOR MORE THAN 25 CENTURIES

The Japanese keep many festivals; two of the principal dates are February 11 and April 3. On the first of these days they celebrate the accession of their earliest emperor, and on the second the day of his death. His name was Jimmu, and he is said to have lived more than twenty-five centuries ago. The Japanese claim that from him their one dynasty of emperors has ruled in unbroken succession ever since; but the dates for the first part of this long time are very uncertain. Still, we know that the Japanese were advancing in civilisation, and the early independent

tribes were passing under the leadership of one dominant tribe centuries before Julius Caesar discovered Britain for the Romans.

The history of Korea, too, goes very far back. More than a thousand years before Christ, there was a migration of the old civilised Chinese into the mountainous peninsula. They ousted the Cave Dwellers and formed a cluster of independent States which later united under one ruler. A great stream of Chinese and Koreans poured into Japan, and merged with its people during the centuries before and after the birth of Jesus.

Nothing is certain about these early days except that there was much coming and going between the peninsula and the islands. We know that the Japanese, like the Chinese, busied themselves quite early with bringing water to their rice-fields, making canals, and developing trade and manufactures. They also from the first paid great reverence to their ancestors. By degrees, the person of the Emperor (or Mikado) became sacred and unapproachable to the mass of the people, as was the case in China.

HOW BUDDHISM TOOK ITS PLACE IN THE LIFE OF JAPAN

It was about the sixth century, when the Angles and Saxons were settling in their new homes in Britain, that the religion of Buddha spread into Japan by way of China and Korea. Eventually it took its place side by side with the older national religion of Shintoism, not driving it out, but supplementing it, as it were; and beautiful Buddhist temples, as well as Shinto shrines, rose up over the country.

Troublous times followed. There were many grades of nobility all fighting to be first, and many officers and ministers, into whose hands the real Government of the kingdom passed, as the Mikado became more and more a mere puppet in a gilded prison, his person sacred and invisible, except to the highest officials. The head of the acting Government for 700 years was called the Shogun. Yoritomo was the name of the first Shogun. He was a great general and organiser, and died the same year that King John ascended the throne of England. The last Shogun gave up his power, henceforth to live as a private gentleman, on the eve of our own time, in 1868.

In many ways the state of affairs in Japan during the rule of the Shoguns may be compared to that of Britain

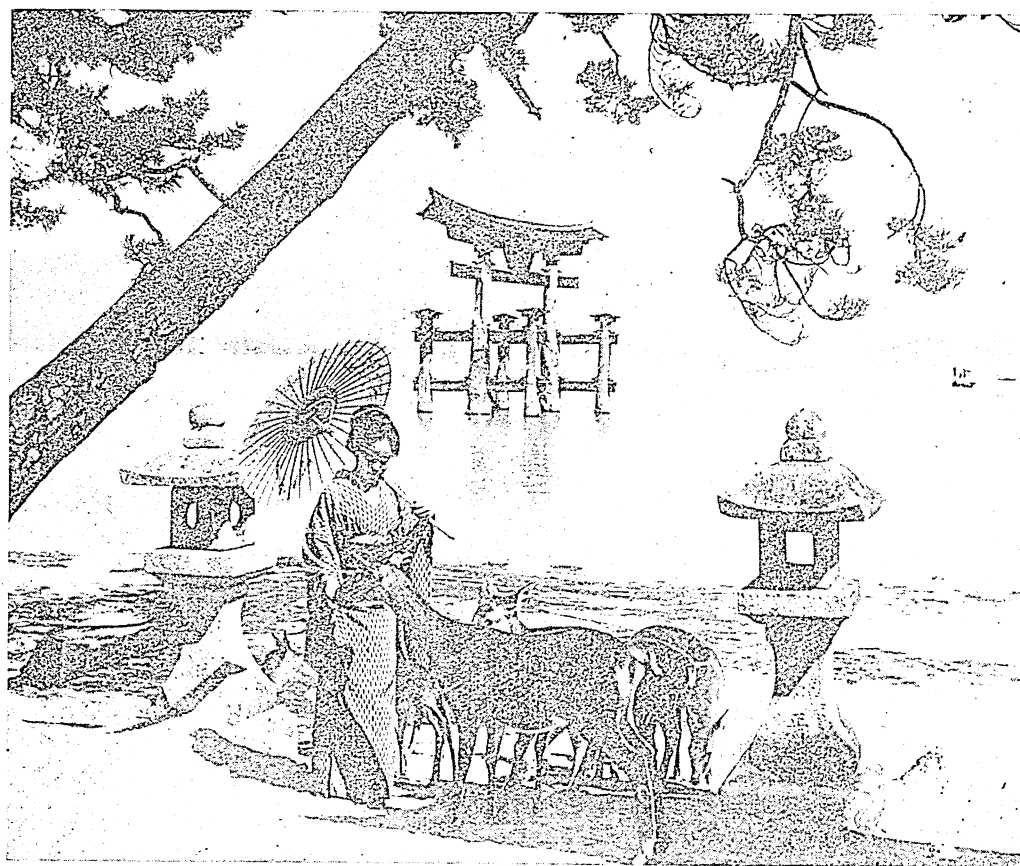
LIFE IN A BEAUTIFUL LAND



GATHERING SHELLFISH ON THE COAST OF JAPAN



PLOUGHING THE RICE-FIELDS



ON THE SHORE OF MIYAJIMA, A SACRED ISLET ON THE INLAND SEA OF JAPAN

The pictures on these pages are reproduced by courtesy of the Japanese Embassy, Mr. Herbert G. Ponting, and others

COUNTRIES

before and during the Wars of the Roses. Quarrels between rival families were fought out in pitched battles; nobles lived in strong castles surrounded by armed retainers; and when a common foe arose those who held the land were bound to provide forces to meet the danger, much in the same way as was done in England in feudal times.

One of these times of national danger arose towards the end of the thirteenth century, when Kublai Khan, the Mongol Emperor of China, with a great host of Chinese and Koreans, invaded Japan. As with the Spanish Armada off the coast of Britain, the great host was destroyed by a storm, and the island empire of Japan can boast, as we do, that no invader has since tried with success to descend on its shores.

When Marco Polo stayed at the court of Kublai Khan he naturally heard much of Japan, and after he returned to his native country he was persuaded to write a book about his wonderful travels. In it he introduced Japan to Europe, thereby greatly exciting and interesting his readers: He called it Cipango, and said: "A very great island it is. The people are white, civilised, and well favoured. They are idolaters, dependent on nobody. And I can tell you," continues Marco, with many more interesting details, "the gold they have is endless, for they find it in their own lands."

THE ANCIENT PIRATES OF JAPAN WHO SAILED THEIR JUNKS TO AMERICA

In the map used by Columbus, two centuries later, this rich island was drawn large on the east of Asia, with no American continent between it and Europe.

In those days, when men were reaching out to find each other, and to discover new countries all over the world, there were pirates on every sea. The Japanese were not behind in daring acts, and their junks faced the seas fearlessly, passing to Siam, to India, and even to Mexico.

It was not long after the death of Columbus that the Portuguese found by an eastward route what he had tried in vain to find by sailing west. From the rich Indies they passed to China, and then to Japan. Christian missionaries soon followed the traders and explorers. The famous missionary Francis Xavier managed to get a footing in the southern island of Kiushiu, and conducted a short but brilliant mission. He says in his letters

home that the Japanese "are wonderfully inclined to see all that is good, and have an eagerness to learn."

Towards the end of the sixteenth century Nagasaki, the chief southern port, with a fine harbour where the largest Portuguese ships could ride at anchor, accepted Christianity. Christian churches were built on the sites of old Buddhist temples. But the progress of the new religion was stopped before long. A great soldier of fortune, Hideyoshi, rose to power. He is often called the Napoleon of Japan, so great were his victories. He conquered Korea, and even planned the invasion of the Chinese Empire.

A GENERAL WHOSE DESCENDANTS RULED JAPAN FOR 250 YEARS

His successor, also a great general, overthrew all his rivals, and founded a dynasty of Shoguns which ruled a united Japan in peace for 250 years. To secure this peace, the Roman Catholic missions and the foreign traders were sent away, and the country was closed to all but the Dutch; within narrow limits they alone were allowed to trade at Nagasaki. Some of the most beautiful Japanese work is to be seen at the Hague, gifts from the Mikados of those days.

It was in the middle of the nineteenth century that there came a great and wonderful change. Japan had gone on all those peaceful years making improvements in the produce of the country, in the fields, in the tea-gardens, in the hand-loom, in the pottery factories, and in many other arts in which the people are so clever and tasteful. But discontent was smouldering, and a longing to extend was growing in the hearts of the people.

When bold Captain Perry arrived with a United States fleet, to insist on breaking the barriers which had kept Japan away so long from the rest of the world, the old system seemed to fall at a blow.

JAPAN'S GREAT LEAP FROM THE SLEEP OF CENTURIES INTO THE LIFE OF TODAY

Various treaties were signed, Yokohama was opened to foreign trade, the Shogun had to retire with all his old-fashioned ideas and ways, and the Mikado was restored to the full and ancient powers of his office, and reigned over the people in fact as well as in name.

It makes us almost breathless to read of the rapid changes that took place in Japan during fifty years. Once in contact with the West, there were no

half-measures. The old feudal ways were swept away in most dramatic fashion, as Japan leapt out of the Middle Ages into the full stream of modern life with its newest inventions and movements. Japanese came westward to learn new ways, and received instructors and organisers from Europe in their own country. Roads were improved and bridges built; railways, telegraphs, telephones, were started all over the country. Banks, warehouses, mills, and factories rose up quickly, law courts were established as well as a constitution, granted in 1889, which gave Japan a House of Commons elected by the votes of the people.

Education on modern Western lines was started everywhere; Western fashions in dress and manners were largely adopted. A splendidly efficient navy and army were created in a few years. They were needed, for, besides all the astounding upheaval and amount of work and expense involved in all these changes, Japan had to face two wars with its opposite neighbours. The first, with China, was in 1894 and 1895. Six months decided the contest, Japan being victorious on sea and land. The island of Formosa was added to the Mikado's empire, and the world realised that a new power had arisen to help in shaping the destiny of the Far East.

JAPAN'S VICTORIOUS STRUGGLE WITH THE GREAT POWER OF RUSSIA

Japan joined the European Powers in the relief of Peking at the time of the Boxer Rebellion, and four years later she found herself in the throes of a gigantic contest with Russia. Admiral Togo, often called the Japanese Nelson, destroyed the Russian Navy in the inner part of the Yellow Sea; and on land the successes were equally great.

Every Japanese boy is brought up to believe that the greatest honour that can befall him is to die for his Emperor and country if need be, and his body is trained by a wonderful system of gymnastics. His courage is matched by his sense of honour as to the sacredness of his promise and the impossibility of yielding while life lasts, and so it is no wonder that the flag of the Rising Sun was carried triumphantly from start to finish in such strong hands. Japan gained half the island of Sakhalin by this war, and established a protectorate in Korea.

In 1910 Korea was annexed by Japan and it is now a part of the Empire, the

Koreans being citizens on an equal footing with the Japanese. The former Emperor has the title of Prince, and other members of the Korean royal family have Japanese titles. At the head of the Korean Government is a Japanese Governor-General.

THE MOUNTAINOUS PENINSULA AND ITS TWENTY MILLION PEOPLE

This mountainous but fertile and populous peninsula, within an area of 85,000 square miles, has a population of approaching 20,000,000, including an increasing number of Japanese. The capital, Seoul, has a resemblance to a miniature Peking. It is enclosed by a wall, with eight gateways as entrances. The population has increased, since the Japanese occupation, to 250,000, of whom 65,000 are Japanese.

Korea is almost entirely an agricultural country, with valuable fisheries round its coast, and its very considerable mineral wealth is being gradually developed. It has coal and iron, gold and copper, and a hopeful beginning has been made with gold-mining. Its agricultural products are rice, which is the principal food, beans, wheat, barley, cotton, and tobacco. Its live stock are of a good quality and hides are exported. Bad roads were a drawback, but communications are improving, and railways are extending.

The Korean people are industrious, and peaceful to the verge of timidity. They long paid tribute to China for her protection, and always had leanings towards that country (from whom they accepted the Confucian religion) in preference to Japan, with whom wars had been frequent in the past. During the war between China and Japan in 1894 and 1895, much fighting occurred on Korean soil; but the success of Japan placed the country under Japanese influence, which became paramount after the decisive Japanese victory over Russia.

WHY JAPAN TOOK A LITTLE NATION INTO HER EMPIRE

The Japanese views of Korea were that the nearness to their shores of a weak and backward nation was a source of danger, especially when Russia began to influence Korea; that the Koreans were too degenerate to use properly the natural resources of their land; and that the increase of the population of Japan required an area for its overflow which could only be found in Korea under stable, yet progressive government.

The material prosperity of the country has unquestionably increased since the annexation by Japan. Education is advancing, much of it being under the influence of Christian missions. Trade is largely in the hands of the Japanese. The chief ports are Chemulpo (for Seoul), Chinnampo, and Fusan.

It would need a Japanese to describe the beauty of Japan, which has so much to do with the people's fervent patriotism and their perfect taste in art.

JAPAN, THE LAND OF DAZZLING BLOSSOMS AND FAIRY LANDSCAPES

The lovely scenery of this part of the world is set off, as it were, with a garment of most gorgeous and wonderful colouring, made of blossoms of every hue. Public holidays are set apart for people to go out to admire the fruit trees in flower, the cherry, and plum, and peach blossoms. Men travel miles to visit the great fields of irises and lilies, all most delightful to the eye. Many of our favourite flowers come to us from Japan; but there the purple wistaria hangs in profusion over great trellises, the camellia trees grow as high as a house, and the masses of roses, convolvulus, and azaleas form dazzling banks of colour. The tall bamboos, so useful as well as ornamental, and high, feathery grasses, graceful pine trees and lacquer trees, all help to make up the real fairy landscapes of which we get hints on the screens and fans and embroideries worked and painted by those who live among these beauties of Nature.

We can perhaps match most of the fine mountains and the leaping, foaming waterfalls, the rich plains and valleys and the short rivers that water them—the longest Japanese river is shorter than the Thames. But we have nothing to put beside the mysterious wonder of Fujiyama, the sacred mountain so deeply beloved by the Japanese and reproduced by hundreds of their artists. It rises, solemn and lonely and grand, in a beautiful cone-like shape more than two miles above the plain, and it is more than a hundred miles round its base.

FUJIYAMA, THE FAMOUS JAPANESE MOUNTAIN OVER TWO MILES HIGH

The mountain is near the sea, and not far from the capital of the empire, Tokyo. It takes many hours to climb the two miles of its height, even with the help of coolies; but what a view from the top! Over fertile plains and glinting water, to

mountains beyond. This climb of two miles into the air gives us an idea of the changes in vegetation to be seen when travelling thousands of miles towards the Pole. At the top of the mountain the climate is that of the tundra, or bog-land; below that come the low, stunted trees. Below them we come to pine forests, then grassy lands and steppes, then all the crops that grow in warmer regions: barley, beans, peas, tea, cotton, and rice.

Among the drawbacks which Japan cannot escape are the liability to earthquakes, and to the sudden and violent storms known as typhoons. Many shipwrecks and much loss of life occur year by year from these terrible storms which sweep the Japanese seas. The earthquakes are not so frequent in a dangerous form, but are more appalling when they are violent. In 1896 the death-roll of the worst earthquake then known reached 27,000; but in September, 1923, when Tokyo and Yokohama were almost destroyed, the loss of life and destruction were many times greater, and more than a million people were made homeless.

THE EVER-THREATENING DANGER FROM THE TWENTY VOLCANOES OF JAPAN

There are about twenty volcanoes which are either active or are only slumbering, and may at any time become active, and wherever such underground unrest exists earthquakes may come. As a safeguard against earthquake shocks Japanese houses are built of light materials, so that their fall may be less dangerous. But light materials are the more inflammable, and in the Tokyo disaster many of the deaths were from fire following the fall of the houses in the affected area.

Before the earthquake Tokyo had a population of two millions, and Yokohama had 430,000. The Japanese people never showed to greater advantage than in their heroic recovery from a disaster that seemed overwhelming. The Imperial Palace in Tokyo was happily one of the buildings that escaped destruction.

Japan has sixteen towns with a population of over 100,000. Yokohama is the place where most visitors land. Here is the tomb of Yoritomo, the first Shogun, and a few miles away is the huge bronze image of Buddha, one of the greatest Japanese works of art. It is nearly fifty feet high, and leaves a wonderful impression of peace and majesty on the mind.

JAPAN AND ITS STORY

The island of Kiushiu, on which stands Nagasaki, a city with 180,000 people, with landlocked harbour and granite docks, has played a large part in the country's story. On this island the Portuguese traders and missionaries landed, and European civilisation was first made known to the Japanese people.

THE RAPID GROWTH OF KOBE FROM A TINY FISHING VILLAGE

Since the door has been flung wide open, Kobe, on the beautiful Inland Sea, has grown from a fishing village into a large and bright city of 650,000 people, where much of the home trade is carried on, and foreign firms are well represented. We can take the train along the lovely shores of this Mediterranean of Japan between Honshiu and the two smaller southern islands; or, better still, on our way from Nagasaki in a steamer through the deep, clear, blue water past countless islands and hills clothed in vivid green; and there is ever the living interest of the numerous fishing-boats and curious-looking junks, and the tiny villages hidden in unexpected nooks along the coast.

Osaka, with a population of 1,300,000, another manufacturing centre near the Inland Sea, is renowned for its beautiful temple and fine bazaars. By Osaka flows the river that drains Lake Biwa, the largest lake in Japan, about the size of Lake Geneva, and very beautiful.

From Osaka we can take the train to Kyoto, with 615,000 people, an old capital of Japan, famous for its wonderful architecture and interesting memories. The Mikado's old palace here covers many acres of ground.

These great populations, gathered in the cities which mostly skirt the beautiful bays of Japan's indented coast, are signs of the change that has come over modern Japan in industry as well as in education and government. Besides being a thrifty agricultural country, Japan has always been skilful in manufactures, but chiefly of a delicate kind. Her swords were as famous as those of Damascus or Toledo.

THE NEW TRADE RIVAL OF THE NATIONS OF THE WEST

Her porcelain had, and has still, a world renown. Her lacquer-ware and her ivory carvings are unsurpassed. They are accompaniments of her natural taste in art, which has its finest expression in her paintings. But now Japan has entered into competition with many of the industries

of the West. She is using her own iron and coal to make steel; she builds ships for her defence and her commerce, and raises her own petroleum to drive them. Half a million of her people are workers in the extraction and manufacture of her own minerals. Long ago she learned silk-weaving from China; now she has learned the secrets of cotton and woollen manufactures from England. Her porcelain and earthenware are surpassing the modern products of China. She is trading with the whole world, and is using her own ships.

She has a mercantile fleet, steam and sailing, of four million tons. Her navy is the third most powerful in the world. Her people are second to none in the universality of their education. She has nine million children in her elementary schools. She stands abreast of the foremost nations, whatever the test may be. Sixty years ago she saw the superiority of the civilisation of the West and frankly adopted it as a learner. Now she has won her place in the world.

HOW WE HAVE COPIED JAPAN'S DRESS AND HOW JAPAN HAS COPIED OURS

And yet she has had the wisdom to retain, so far, such of her old ways and customs as go to the making of her distinctive character. Western dress has been adopted at court and in the army and navy, and in many circles; but the kimono, so familiar to us in dressing-gown shape, and in the popular Gilbert and Sullivan opera of *The Mikado*, is still the distinctive garment of the country, made in gorgeous embroidered silks and satins for the rich, and in very simple materials for the poor. It is worn with a broad sash, which keeps all tidy, and serves, with the deep kimono sleeves, instead of pockets.

Japanese footwear is quite different from ours. There is a thick white sock, with a division for the great toe, worn with the shoe or clog, which is taken off on entering a house, so as not to soil the mats used as seats, for a Japanese house is very simple, with scarcely any furniture. Often the greater part of the house is made of wood or tough paper, and the partition walls are simply sliding doors. Paper serves for umbrellas and waterproofs, when a cloak made of thatch is not available.

The beds are made of thick quilts laid on the floor, with wooden pillows, all being moved away in the daytime. Everything in a Japanese home is most tastefully arranged to give pleasure to the eye.

Perhaps Japanese children have the happiest time of any children in the world. Their fathers and mothers are devoted to them, and train them from babyhood to be self-controlled and polite to everyone, to be gentle in their ways, and to find enjoyment in work.

Spoilt, selfish, idle, cross, and miserable children are rarely met with in Japan. They have plenty of lessons and plenty of play. And their toys! We all know the delights of Japanese dolls—the children are so like them—and the clever tops and kites, and wonderful model villages. There are many feast days specially for the children, when all are dressed in their brightest kimonos and sashes, and look as gay as the flowers and butterflies.

The Feast of Dolls is for the girls, when the "honourable" dolls and their houses, so carefully kept from generation to generation, are brought out and enjoyed, and the little ones have presents of dolls and dainty articles for their use. The boys have their turn on the Feast of Flags, when images of soldiers, heroes, wrestlers are bought for them, as well as helmets, flags, bows and arrows. The sham fight, which is a favourite game on this festival, brings to memory the fights of the rival clans in the old feudal days. Kite-flying and top-spinning done in really scientific fashion are grand pastimes, joined in by quite old men.

THE MIDNIGHT FLEET OF THOUSANDS OF LITTLE BOATS OF STRAW

The dead are never forgotten in Japan. Every summer the Feast of the Dead is celebrated all over the country, with processions, the carrying of fans and banners, and the tombs are illuminated with beautiful lanterns shedding many-coloured lights. The end of the feast at Nagasaki is very striking. After midnight thousands of little ships of straw, carrying small offerings of fruit and money, and the lighted lanterns from the tombs, are launched on the waters of the bay. As each little craft catches fire the soul it is supposed to carry is said to have reached again the Unseen Land.

Many travellers now go to Japan, and all admire its scenery and flowers, and its temples, tombs, and festivals, which recall the deeply interesting past. But more interesting still is the life and work of today in the great cities, and in the wide-spreading country—the swift rickshaw whirling past; the shops full of the

clever work of the nation; the passing crowds, so clean and orderly.

After her defeat of Russia, Japan ranked among the Great Powers of the world. Her advance in international position was differently regarded by different nations. By Britain it was welcomed; by Germany it was resented; and the United States was uneasy about a strong naval Power establishing itself in the Pacific. Before the Russo-Japanese war Great Britain and Japan had a friendly understanding, which after the war became an alliance.

THE PART PLAYED BY THE EASTERN EMPIRE IN THE GREAT WAR

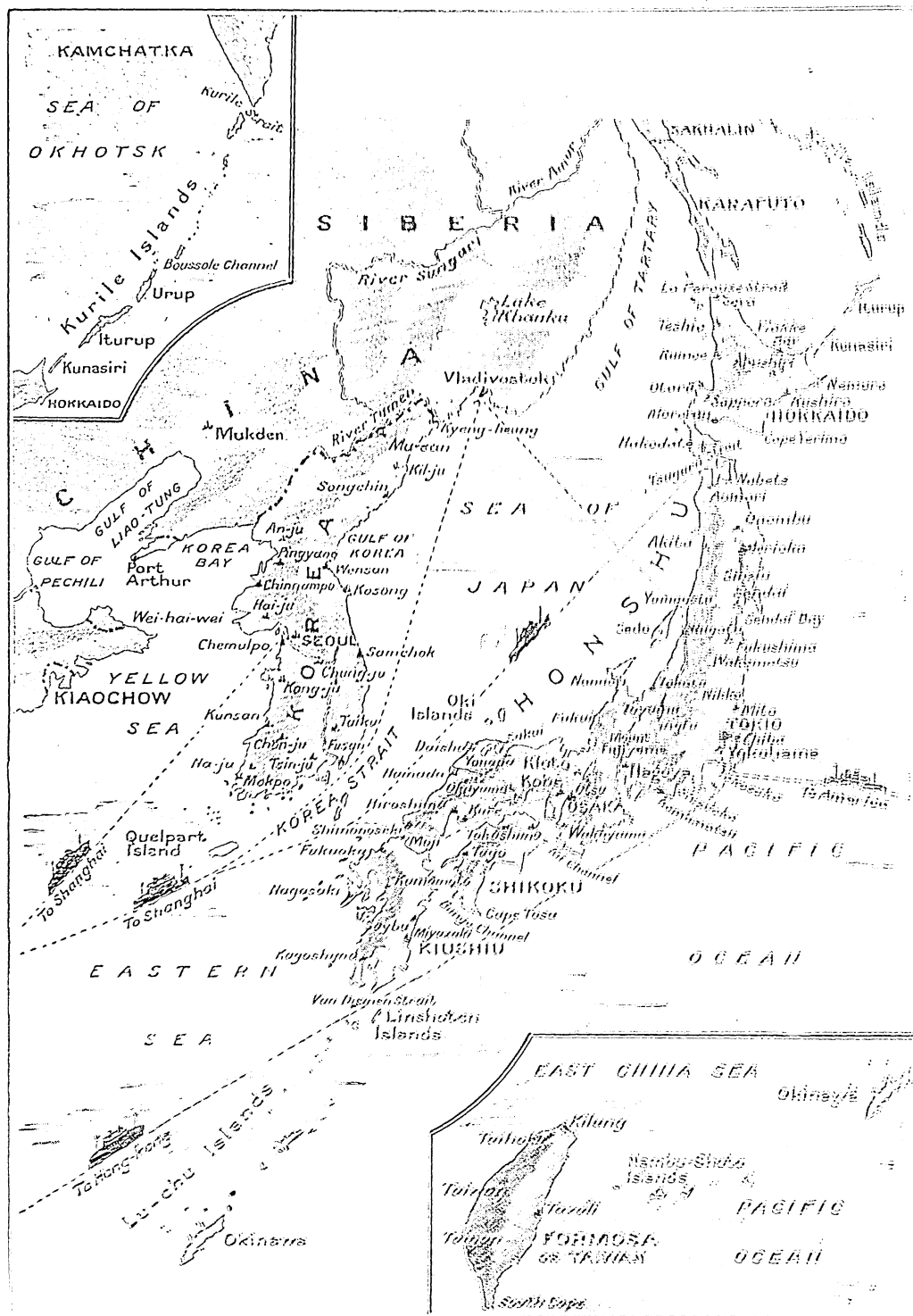
During the Great War the Japanese joined the Allies and gave cordial help. In conjunction with a small British force they captured the German outpost of Kiaochow. Japanese troops helped to garrison Siberia in the doubtful time following the Russian Revolution, and their navy took a useful part in patrolling the seas against submarines. At the close Japan claimed the right to hold in China whatever privileges had been granted to Germany, including mining and railway influence on the Shantung Peninsula. To this China would not assent, and, as the claim was admitted in the Versailles Peace Treaty, China withheld her signature from that agreement.

But Japan has shown an honourable disposition to abide by her word in international affairs, and to join in the movement towards a world-wide peace. In the making of the Washington Agreement for lessening the world's great navies, and preserving a pacific spirit in the Pacific, Japan was not one of the nations that haggled and bargained and clung fast to reservations. Indeed, by separate agreement with China in February, 1922, she definitely withdrew from Shantung.

THE GREAT PLACE JAPAN HAS WON AMONG MODERN NATIONS

It is true that she resents any discrimination against herself on the ground that she is Asiatic; but that is because, by her progress and education and attainments, she has won the right to a place in the first rank. With Korea and the islands of the Pacific committed to her guardianship under the League of Nations, she has a population of 80,000,000 souls. After Great Britain, China, Russia, the United States, and France, she leads the world in numbers. Yet eighty years ago the world thought of this great nation as a semi-civilised land.

MAPS AND PICTURES OF JAPAN



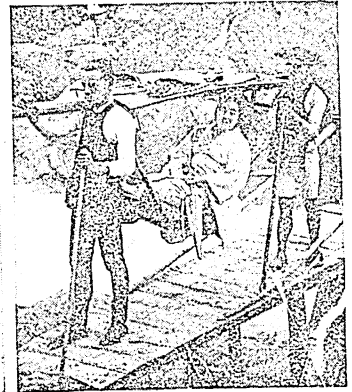
AS CAN BE SEEN IN THIS RELIEF MAP, JAPAN CONSISTS OF A LONG STRING OF ISLANDS
LARGE AND SMALL



HAPPY YOUNG PEOPLE OF
YOKOHAMA



A COOLIE OF
KOREA



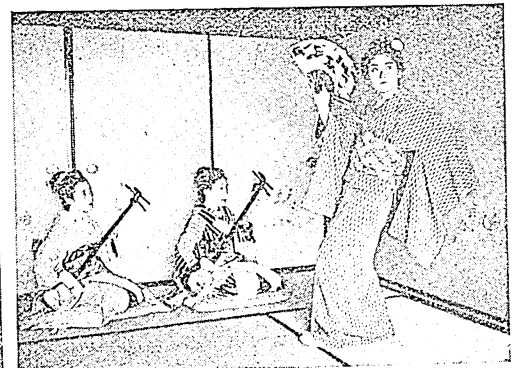
CROSSING A RIVER NEAR
NIKKO



AMONG THE BEAUTIFUL CHRYSANTHEMUMS OF JAPAN



AN AINO FAMILY AT HOME



A GEISHA GIRL DANCING



TWO LADIES OF JAPAN
AT HOME



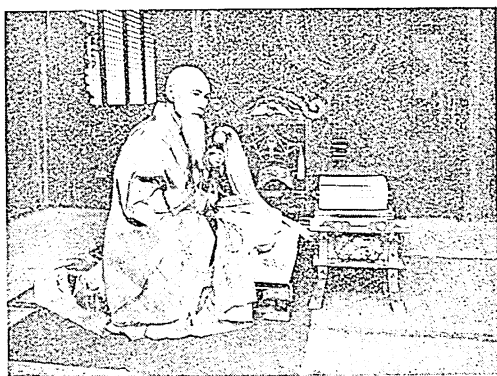
A LADY WRITING
A LETTER



LADIES OF JAPAN-OUT
FOR A WALK



A PICTURESQUE GROUP OF SHINTO PRIESTS

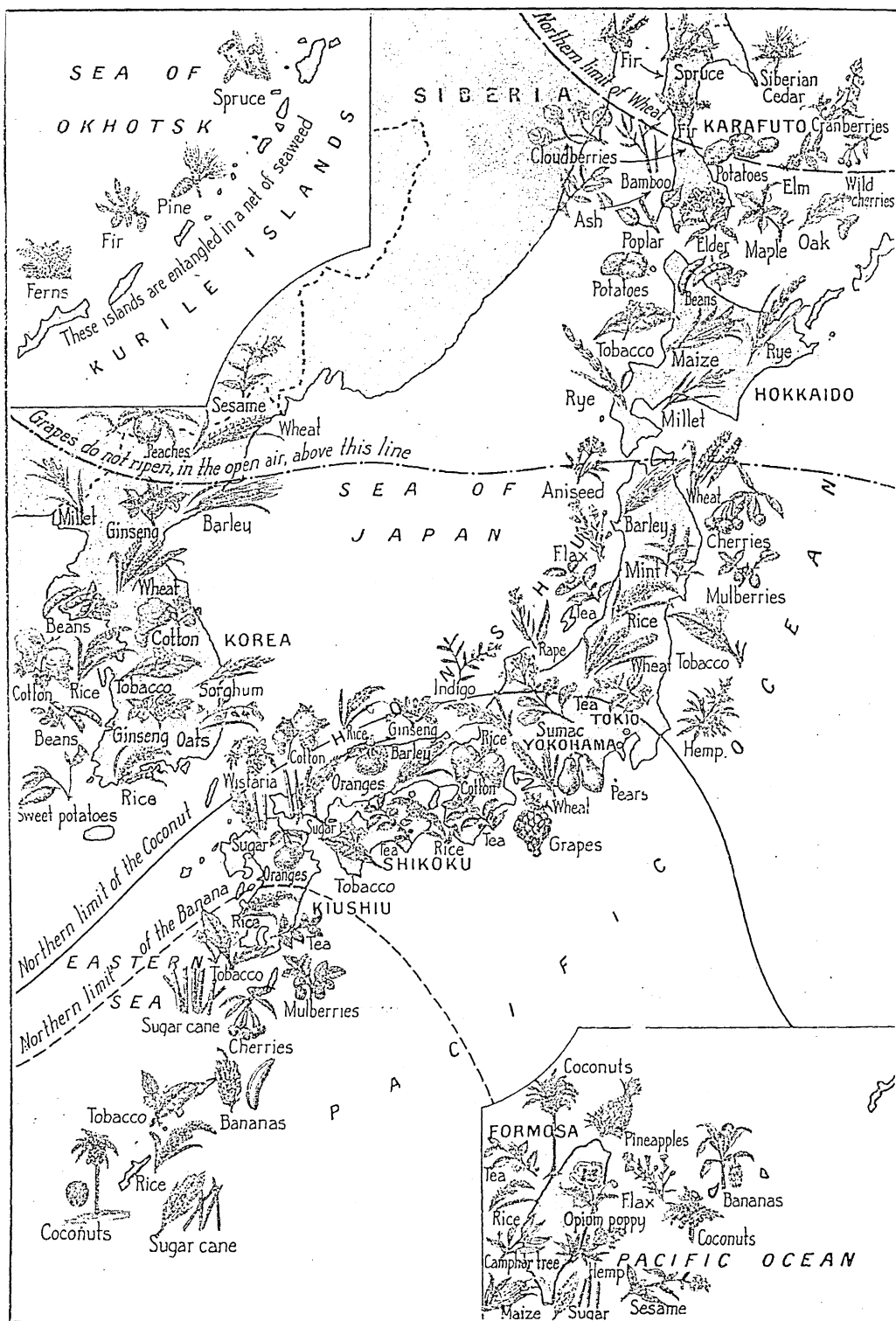


A VENERABLE BUDDHIST PRIEST



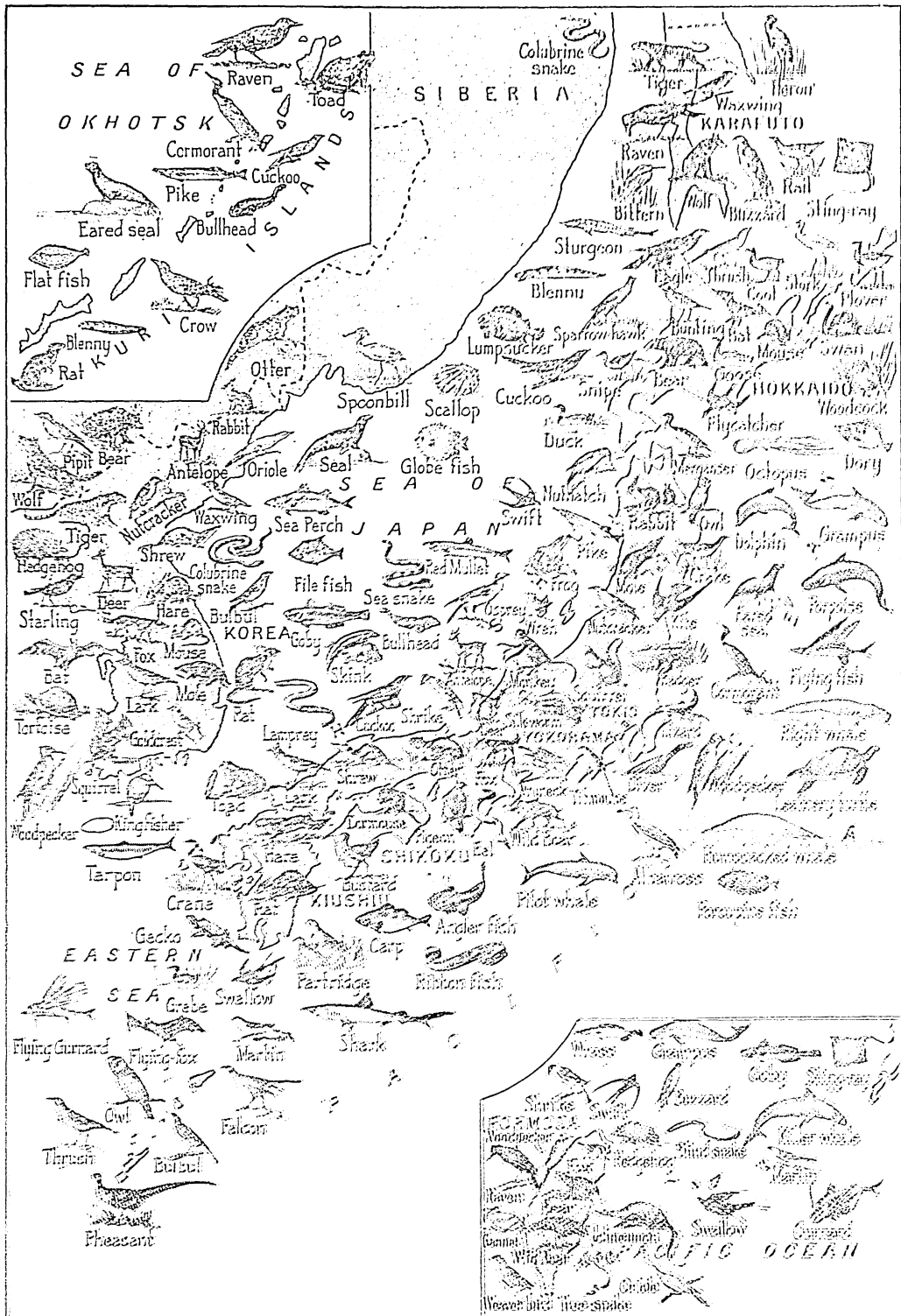
SPINDLING COTTON YARNS AT HOME

THE PLANTS OF JAPAN & HER DEPENDENCIES



JAPAN HAS A POOR SOIL. AND ONLY BY UNTIRING INDUSTRY IS SHE ABLE TO GROW THE
MANY USEFUL PLANTS SHOWN HERE

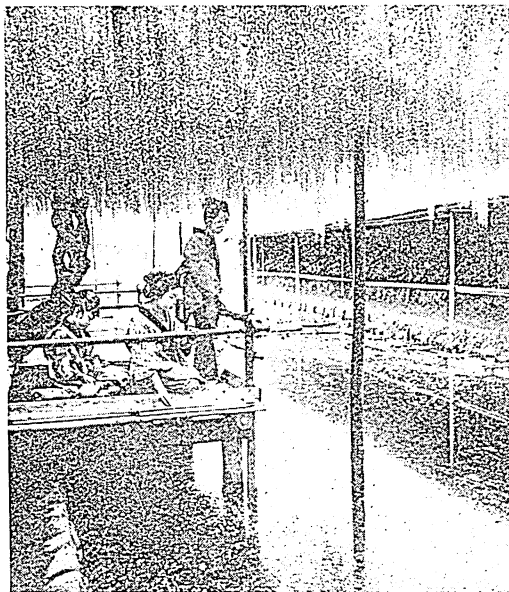
THE ANIMAL LIFE OF THE JAPANESE EMPIRE.



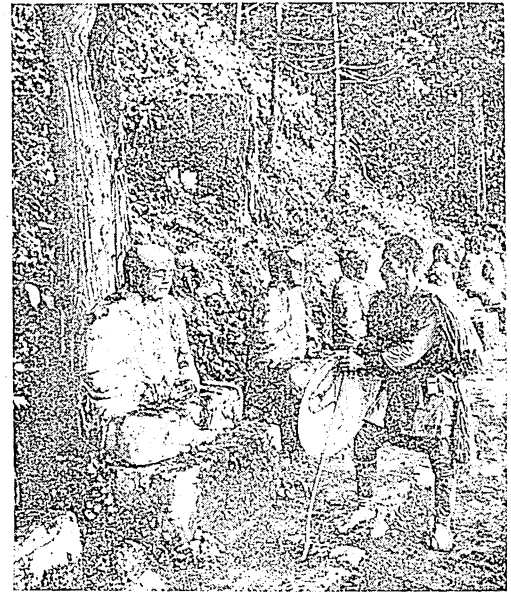
AS SHOWN IN THIS PICTURESHAP JAPAN'S ANIMAL LIFE IS REMARKABLY LIKE THAT OF GREAT BRITAIN



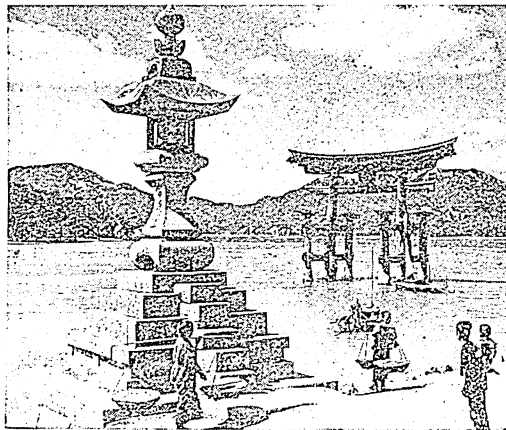
A BEAUTIFUL IRIS GARDEN IN JAPAN



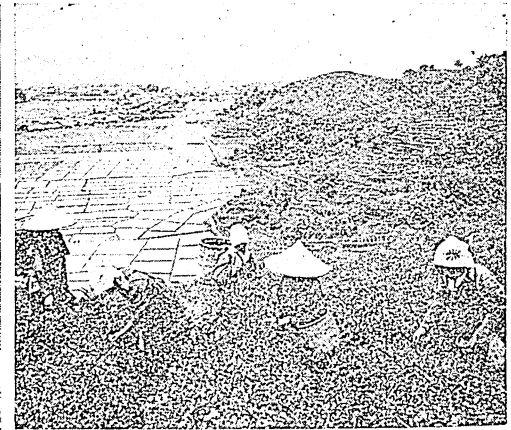
A QUIET HOUR BENEATH THE WISTARIAS



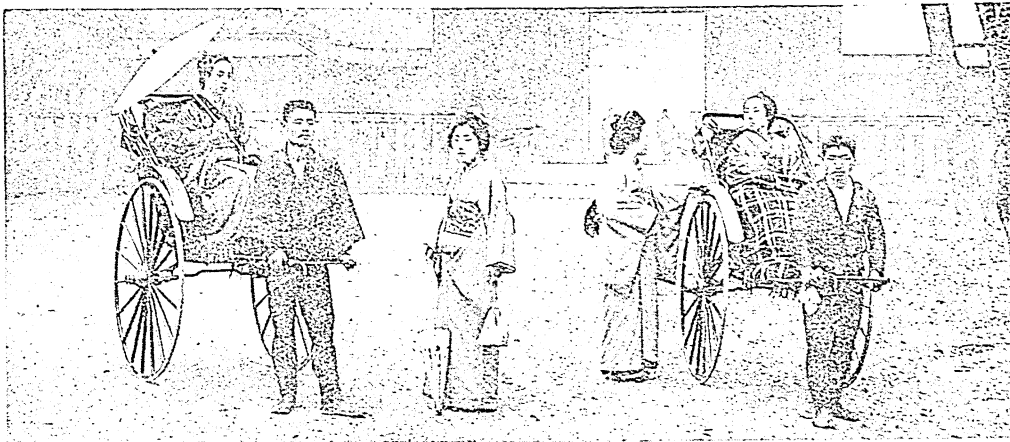
IN A TEMPLE GARDEN AT NIKKO



THE TORII FORMING THE APPROACH TO
THE TEMPLE AT MIYAJIMA



TEA-GARDENS ON THE HILLSIDE AND RICE-FIELDS
IN THE PLAINS IN SHIDZUOKA



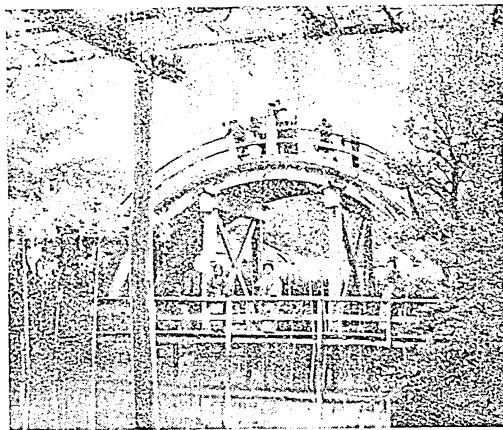
VISITORS TO THE SHIBA TEMPLE IN TOKYO



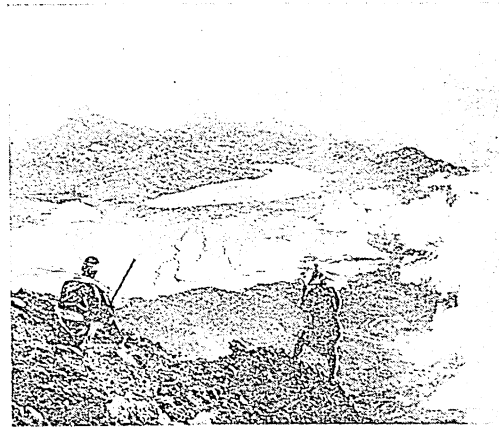
THE FIVE CASTLE AT HIMEJI, CAPITAL OF THE PROVINCE OF HARIMA



CHILDREN ON A VISIT TO THE TEMPLE

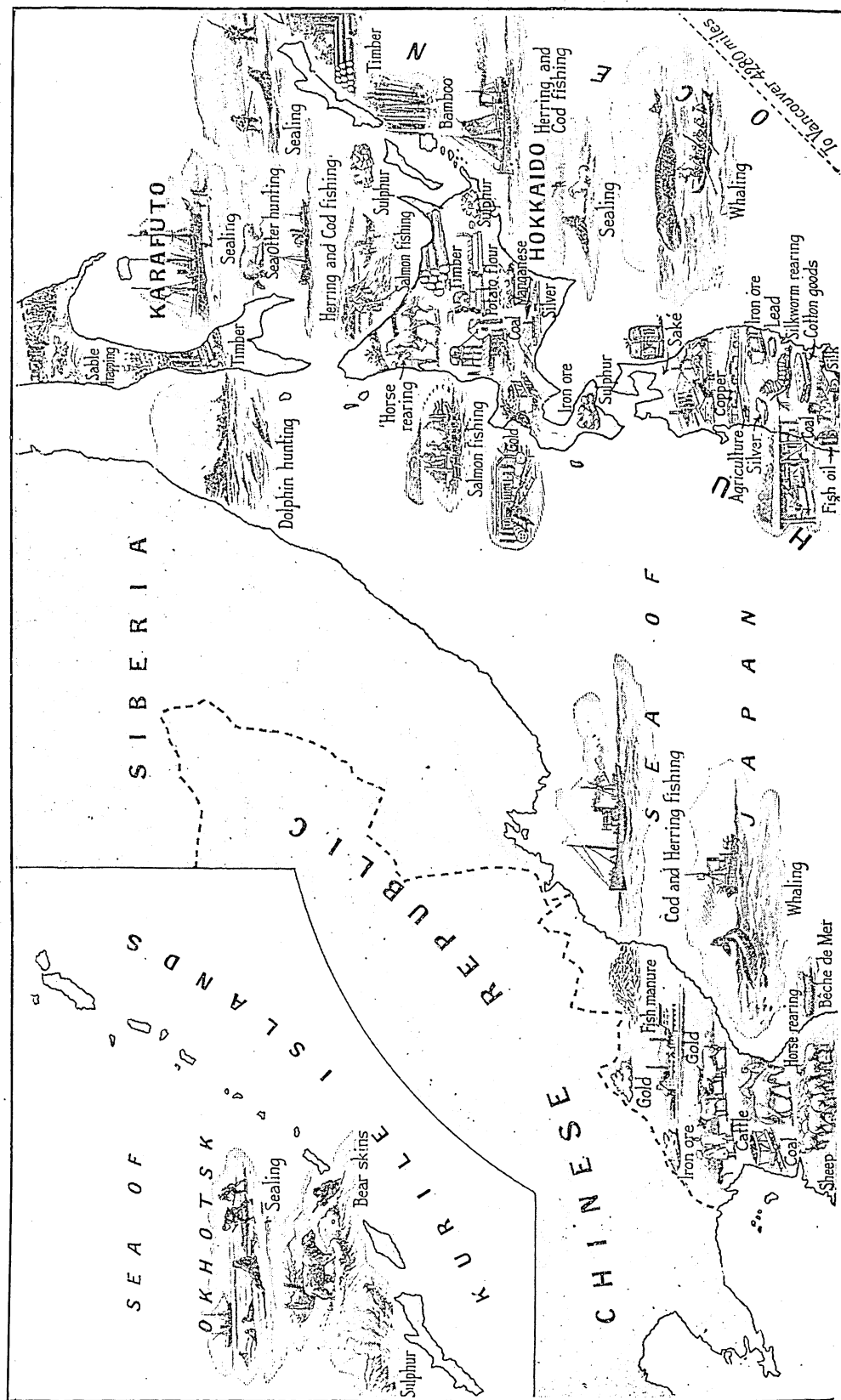


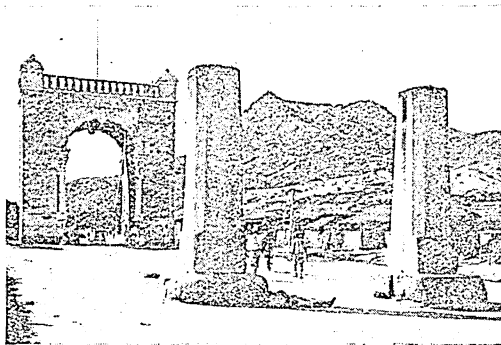
A BRIDGE IN THE GARDEN OF KAMEIDO TEMPLE, TOKYO



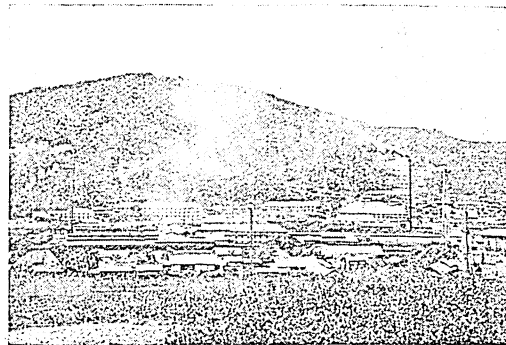
LOOKING DOWN ON LAKE YAMANAKA FROM FUJIYAMA

THRIVING INDUSTRIES THAT HAVE BUILT UP THE PROSPERITY OF JAPAN

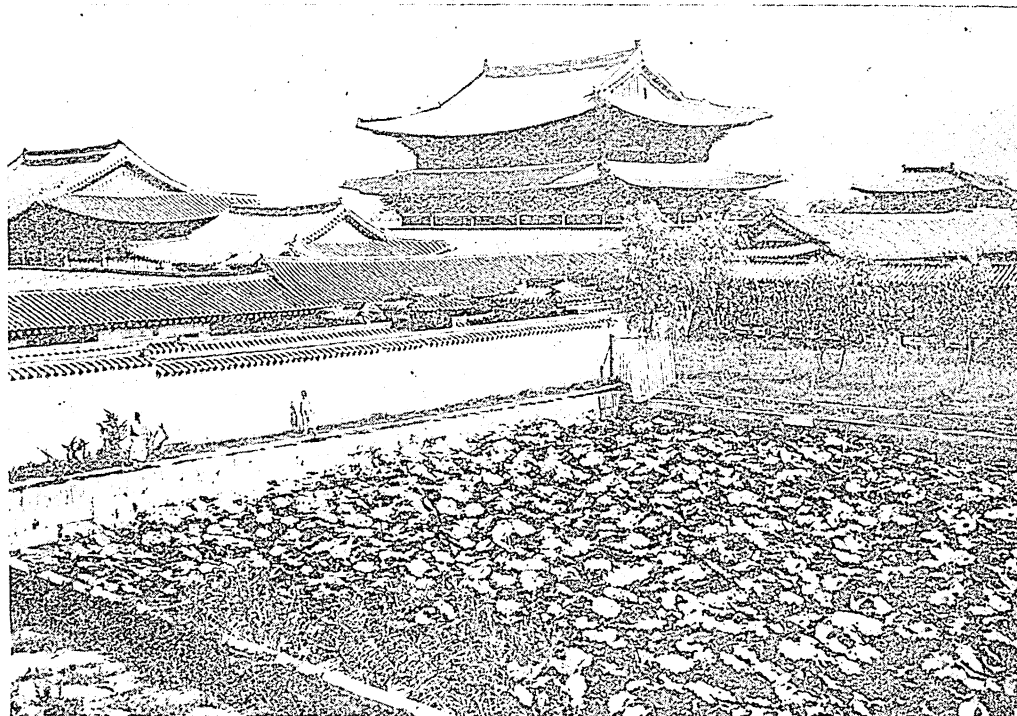




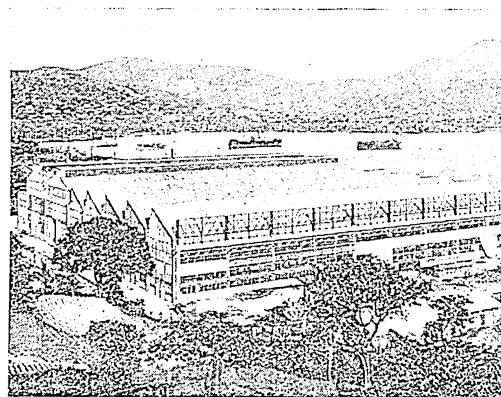
AN ANCIENT GATEWAY AND A
MODERN ARCH AT SEOUL



SILK FACTORIES AT OKAYA IN THE PREFECTURE
OF NAGANO



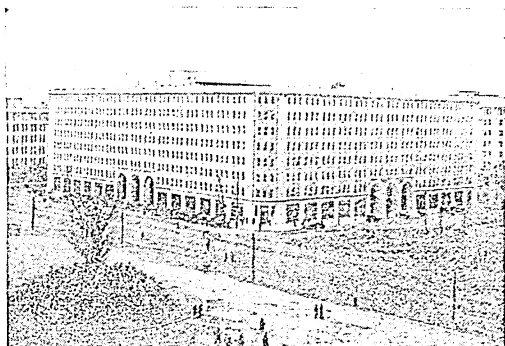
IN THE GROUNDS OF THE OLD IMPERIAL PALACE AT SEOUL, CAPITAL OF KOREA



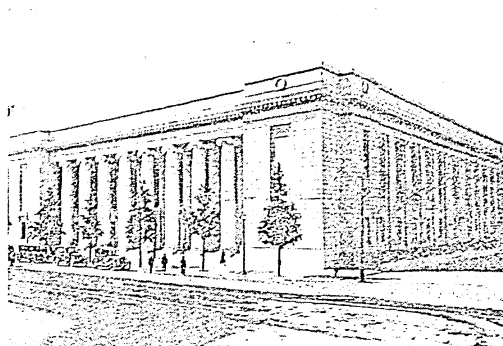
THE FINE HARBOUR AT NAGASAKI



LAKE MOTOSU AND FUJIYAMA



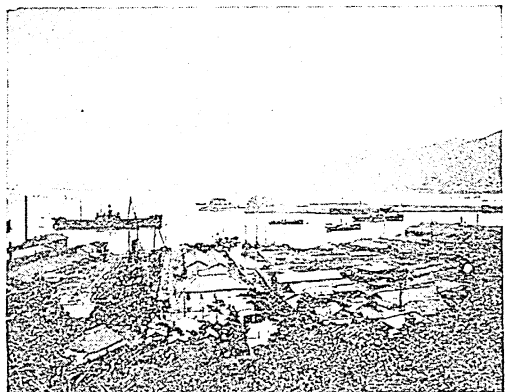
THE MARUNOCHI BUILDING, TŌKYŌ, THE
LARGEST OFFICE IN JAPAN



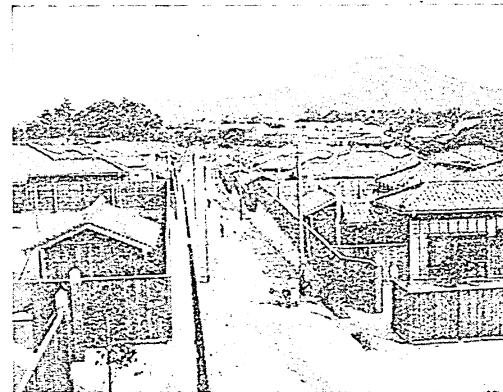
THE MITSUBISHI BANK
IN TOKYO



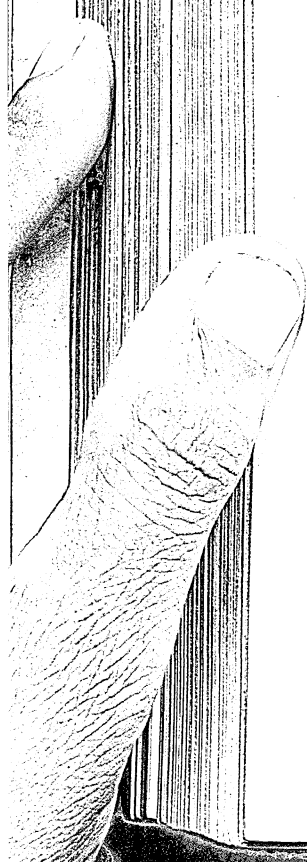
THE ENTRANCE TO THE PALACE OF THE OLD KINGS OF KOREA, AT SEOUL



DOCKYARDS AT HIKOJIMA



NEW JAPANESE HOUSES OF WOOD IN SEOUL



6632

One Thousand Poems of All Times and All Countries

A Great Poem by Wordsworth

IN reading the poems of Wordsworth it is always interesting to know when each poem was written, for nearly all his writings that have in them elements of greatness were written within ten years—1798 to 1808. Wordsworth wrote verses when he was 14 ; began to write memorable poems when he was 28 ; attained the height of his powers when he was 35 ; had a brief revival when he was 52 ; finished writing when he was 67 ; and died when he was 80. The lines composed a few miles above Tintern Abbey in 1798 were the first indication of his greatness. In them he expresses his attitude towards Nature. He is her lover and votary. The poem is intensely personal. His companion in revisiting Tintern after five years' absence was his beloved sister Dorothy, and towards the close he makes the feeling of the poem a joint delight with her. Understanding of this poem is absolutely essential to a complete understanding of Wordsworth, the supreme English poet of Nature.

TINTERN ABBEY

FIVE years have past ; five summers,
with the length
Of five long winters ! and again I hear
These waters, rolling from their mountain-
springs
With a soft inland murmur. Once again
Do I behold these steep and lofty cliffs,
That on a wild secluded scene impress
Thoughts of more deep seclusion ; and
connect
The landscape with the quiet of the sky.
The day is come when I again repose
Here, under this dark sycamore, and view
These plots of cottage-ground, these
orchard-tufts,
Which at this season, with their unripe
fruits,
Are clad in one green hue, and lose them-
selves
'Mid groves and copses. Once again I see
These hedgerows, hardly hedgerows, little
lines
Of sportive wood run wild ; these pastoral
farms,
Green to the very door ; and wreaths of
smoke
Sent up, in silence, from among the trees !
With some uncertain notice, as might seem
Of vagrant dwellers in the houseless woods,
Or of some hermit's cave, where by his
fire
The hermit sits alone.

These beauteous forms
Through a long absence have not been to
me

As is a landscape to a blind man's eye ;
But oft, in lonely rooms, and 'mid the din
Of towns and cities, I have owed to them,
In hours of weariness, sensations sweet,

Felt in the blood, and felt along the heart ;
And passing even into my purer mind,
With tranquil restoration : feelings, too,
Of unremembered pleasure ; such, per-
haps,
As have no slight or trivial influence
On that best portion of a good man's life,
His little, nameless, unremembered acts
Of kindness and of love. Nor less, I trust,
To them I may have owed another gift,
Of aspect more sublime ; that blessed
mood,
In which the burthen of the mystery,
In which the heavy and the weary weight
Of all this unintelligible world,
Is lightened ; that serene and blessed mood
In which the affections gently lead us on,
Until, the breath of this corporeal frame
And even the motion of our human blood
Almost suspended, we are laid asleep
In body, and become a living soul ;
While with an eye made quiet by the
power
Of harmony, and the deep power of joy,
We see into the life of things.

If this
Be but a vain belief, yet, oh, how oft—
In darkness and amid the many shapes
Of joyless daylight ; when the fretful stir
Unprofitable, and the fever of the world,
Have hung upon the beatings of my
heart—
How oft, in spirit, have I turned to thee,
O sylvan Wye ! thou wanderer through
the woods,
How often has my spirit turned to thee !

And now, with gleams of half-extin-
guished thought,
With many recognitions dim and faint,

POEMS · SONGS · BALLADS : VERSES AND RHYMES WITH MUSIC

POETRY

And somewhat of a sad perplexity,
The picture of the mind revives again ;
While here I stand, not only with the sense
Of present pleasure, but with pleasing
thoughts
That in this moment there is life and food
For future years. And so I dare to hope,
Though changed, no doubt, from what I
was when first
I came among these hills ; when like a roe
I bounded o'er the mountains, by the
sides
Of the deep rivers and the lonely streams,
Wherever nature led ; more like a man
Flying from something that he dreads
than one
Who sought the thing he loved. For
nature then
(The coarser pleasures of my boyish days,
And their glad animal movements all gone
by)
To me was all in all. I cannot paint
What then I was. The sounding cataract
Haunted me like a passion ; the tall rock,
The mountain, and the deep and gloomy
wood,
Their colours and their forms, were then
to me
An appetite ; a feeling and a love,
That had no need of a remoter charm,
By thought supplied, nor any interest
Unborrowed from the eye. That time is
past,
And all its aching joys are now no more,
And all its dizzy raptures. Not for this
Faint I, nor mourn nor murmur ; other
gifts
Have followed ; for such loss, I would
believe,
Abundant recompense. For I have learned
To look on nature, not as in the hour
Of thoughtless youth ; but hearing often-
times
The still, sad music of humanity,
Nor harsh nor grating, though of ample
power
To chasten and subdue. And I have felt
A presence that disturbs me with the joy
Of elevated thoughts ; a sense sublime
Of something far more deeply interfused,
Whose dwelling is the light of setting suns,
And the round ocean and the living air,
And the blue sky, and in the mind of man ;
A motion and a spirit, that impels
All thinking things, all objects of all
thought,
And rolls through all things. Therefore
am I still
A lover of the meadows and the woods,

And mountains ; and of all that we be-
hold
From this green earth ; of all the mighty
world
Of eye and ear—both what they half
create
And what perceive ; well pleased to recog-
nise
In nature and the language of the sense
The anchor of my purest thoughts, the
nurse,
The guide, the guardian of my heart, and
soul
Of all my moral being.

Nor perchance,
If I were not thus taught, should I the
more
Suffer my genial spirits to decay ;
For thou art with me here upon the banks
Of this fair river ; thou my dearest friend,
My dear, dear friend ; and in thy voice I
catch
The language of my former heart, and
read
My former pleasures in the shooting lights
Of thy wild eyes. Oh, yet a little while
May I behold in thee what I was once,
My dear, dear sister ! and this prayer I
make,
Knowing that nature never did betray
The heart that loved her ; 'tis her privi-
lege,
Through all the years of this our life, to
lead
From joy to joy ; for she can so inform
The mind that is within us, so impress
With quietness and beauty, and so feed
With lofty thoughts, that neither evil
tongues,
Rash judgments, nor the sneers of selfish
men,
Nor greetings where no kindness is, nor all
The dreary intercourse of daily life,
Shall e'er prevail against us, or disturb
Our cheerful faith that all which we behold
Is full of blessings. Therefore let the
moon
Shine on thee in thy solitary walk ;
And let the misty mountain-winds be
free
To blow against thee ; and, in after years,
When these wild ecstasies shall be ma-
tured
Into a sober pleasure ; when thy mind
Shall be a mansion for all lovely forms,
Thy memory be as a dwelling-place
For all sweet sounds and harmonies ; oh,
then,
If solitude, or fear, or pain, or grief,

POETRY

Should be thy portion, with what healing thoughts
Of tender joy wilt thou remember me,
And these my exhortations! Nor, perchance,
If I should be where I no more can hear
Thy voice, nor catch from thy wild eyes these gleams
Of past existence, wilt thou then forget
That on the banks of this delightful stream
We stood together; and that I, so long
A worshipper of nature, hither came
Unwearied in that service; rather say
With warmer love—oh, with far deeper zeal
Of holier love. Nor wilt thou then forget
That after many wanderings, many years
Of absence, these steep woods and lofty cliffs,
And this green pastoral landscape, were to me
More dear, both for themselves and for thy sake!

TO MARY IN HEAVEN

This poem by Robert Burns in memory of Mary Campbell was written on the third anniversary of her death. She was also commemorated in his poem on Highland Mary. The poet always seemed to regard her as his ideal of peasant womanhood. After keeping watch outside till the morning star appeared the poet entered his house and at once wrote down the poem that had been shaping itself in his mind. It is one of the few poems in which Burns succeeded without the use of the expressive Scottish vernacular.

THOU lingering star, with lessening ray,
That lov'st to greet the early morn,
Again thou usherest in the day
My Mary from my soul was torn.
O Mary! dear departed shade!
Where is thy place of blissful rest?
See'st thou thy lover lowly laid?
Hear'st thou the groans that rend his breast?

That sacred hour can I forget?
Can I forget the hallowed grove,
Where by the winding Ayr we met,
To live one day of parting love?
Eternity will not efface
Those records dear of transports past;
Thy image at our last embrace—
Ah! little thought we 'twas our last!

Ayr gurgling kissed his pebbled shore,
O'erhung with wild woods, thickening green;
The fragrant birch and hawthorn hoar
Twined amorous round the raptured scene.
The flowers sprang wanton to be prest,
The birds sang love on ev'ry spray,

Till, too, too soon, the glowing west
Proclaimed the speed of winged day.

Still o'er these scenes my memory wakes,
And fondly broods with miser care!
Time but the impression deeper makes,
As streams their channels deeper wear.
My Mary, dear departed shade!
Where is thy blissful place of rest?
See'st thou thy lover lowly laid?
Hear'st thou the groans that rend his breast?

A PEASANT POET'S LAMENT

John Clare, the Northamptonshire peasant poet, was first patronised by people interested in him, and then neglected and forsaken when his mind gave way. Yet after his breakdown he wrote some of his sweetest poems. Here are six verses of one written in the asylum that became his last refuge. The complete poem consists of twelve verses.

AND has the Spring's all glorious eye
No lesson to the mind?
The birds that cleave the golden sky,
Things to the earth resigned,
Wild flowers that dance to every wind,
Do they no memory leave behind?

Aye, flowers! The very name of flowers,
That bloom in wood and glen,
Brings spring to me in Winter's hours,
And childhood's dreams again.
The primrose on the woodland lea
Was more than gold and lands to me.

The violets by the woodland side
Are thick as they could thrive;
I've talked to them with childish pride
As things that were alive.
I find them now in my distress:
They seem as sweet, yet valueless.

The cowslips on the meadow lea,
How have I run for them!
I looked with wild and childish glee
Upon each golden gem;
And when they bowed their heads so shy
I laughed, and thought they danced for joy.

The brook that mirrored clear the sky—
Full well I know the spot;
The mouse-ear looked with bright blue eye,
And said "Forget-me-not."
And from the brook I turned away
But heard it many an after day

But seasons now have naught to say,
The flowers no news to bring;
Alone I live from day to day,
Flowers deck the bier of Spring;
And birds upon the bush or tree
All sing a different tale to me.

THE RETURN OF THE GOLDFINCHES

All lovers of wild garden birds will feel the sympathetic beauty of this address, by Sylvia Lynd, to the goldfinches which have been kind enough to build in her garden. She adorns the whole achievement with the spirit of poetry and kindness. This poem tells us clearly that Mrs. Lynd has the essence of poetry in her, and can find utterance for it. Her husband, Robert Lynd, is the well-known literary editor and critic. This poem is from Mrs. Lynd's book *The Goldfinches*, published by R. Cobden Sanderson.

WE are much honoured by your choice,
O golden birds of silver voice,
That in our garden you should find
A pleasure to your mind,

The painted pear of all our trees,
The south slope towards the gooseberries,
Where all day long the sun is warm,
Combining use with charm.

Did the pink tulips take your eye?
Or Breach's barn, secure and high,
To guard you from some chance mishap
Of gales through Shoreham gap?

First you were spied a fighting pair,
Flashing and fluting here and there,
Until in stealth the nest was made
And graciously you stayed.

Now when I pause beneath your tree
An anxious head peeps down at me,
A crimson jewel in its crown,
I looking up, you down.

I wonder if my stripey shawl
Seems pleasant in your eyes at all.
I can assure you that your wings
Are most delightful things.

Sweet birds, I pray, be not severe,
Do not deplore our presence here,
We cannot all be goldfinches
In such a world as this.

The shaded lawn, the bordered flowers,
We'll call them yours instead of ours,
The pinks and the acacia tree
Shall own your sovereignty.

And, if you let us, we will prove
Our lowly and obsequious love,
And when your little grey-pates hatch
We'll help you to keep watch.

No prowling stranger cats shall come
About your high celestial home;
With dangerous sounds we'll chase them
hence
And ask no recompense.

And he, the Ethiope of our house,
Slayer of beetle and of mouse,
Huge, lazy, fond, whom we love well—
Peter shall wear a bell.

Believe me, birds, you need not fear,
No cages or limed twigs are here.
We only ask to live with you
In this green garden too.

And when in other shining summers
Our place is taken by newcomers,
We'll leave them with the house and hill
The goldfinches' good will.

Your dainty flights, your painted coats,
The silver mist that is your notes,
And all your sweet caressing ways
Shall decorate their days.

And never will the thought of spring
Visit our minds, but a gold wing
Will flash among the green and blue,
And we'll remember you.

THEY COME, BESET BY RIDDLING HAIL

The mad slaughter of war was never more madly illustrated than in the terrific battle of Albuera between the English and the French in the Peninsular War. The description of the storming of the hill that was the key to the position is the most thrilling passage in Napier's great *History of the War*. This is the sketch of the decisive struggle by Thomas Hardy in his magnificent epic poem *The Dynasts*.

THEY come, beset by riddling hail;
They sway like sedges in a gale;
They fail, and win, and win, and fail.
Albuera!

They gain the ground there, yard by yard,
Their brows and hair and lashes charred,
Their blackened teeth set firm and hard.

Their mad assailants rave and reel,
And face, as men who scorn to feel,
The close-lined, three-edged prongs of steel.

Till faintness follows closing-in,
When, faltering headlong down, they spin
Like leaves. But those pay well who win
Albuera!

Out of six thousand souls that sware
To hold the mount or pass elsewhere
But eighteen hundred muster there.

Pale colonels, captains, ranksmen lie,
Facing the earth or facing sky;
They strove to live, they stretch to die.

Friends, foemen, mingle; heap and heap.
Hide their hacked bones, Earth!—deep,
deep, deep,
Where harmless worms caress and creep.

Hide their hacked bones, Earth!—deep,
deep, deep,
Where harmless worms caress and creep.
What man can grieve? What woman weep?
Better than waking is to sleep! Albuera!

THE POEMS OF JAMES WHITCOMB RILEY

Who Bides His Time

Who bides his time, and day by day
 Faces defeat full patiently,
 And lifts a mirthful roundelay,
 However poor his fortunes be—
 He will not fail in any qualm
 Of poverty—the paltry dime
 It will grow golden in his palm,
 Who bides his time.

Who bides his time—he tastes the sweet
 Of honey in the saltiest tear ;
 And though he fares with slowest feet,
 Joy runs to meet him, drawing near ;
 The birds are heralds of his cause ;
 And, like a never-ending rhyme,
 The roadsides bloom in his applause,
 Who bides his time.

Who bides his time, and fevers not
 In the hot race that none achieves,
 Shall wear cool-wreathen laurel, wrought
 With crimson berries in the leaves ;
 And he shall reign a goodly king,
 And sway his hand o'er every clime,
 With peace writ on his signet-ring,
 Who bides his time.

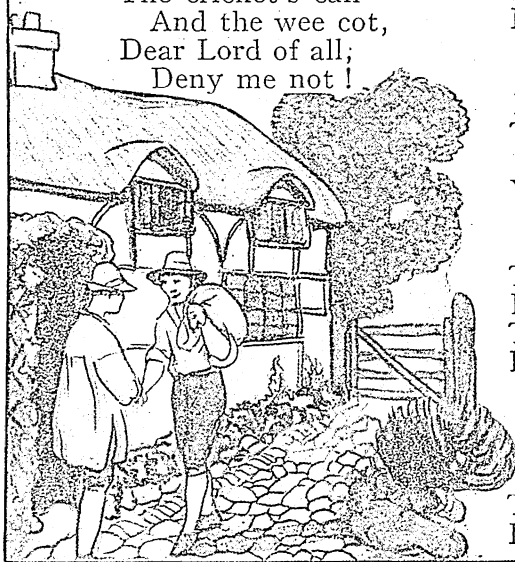
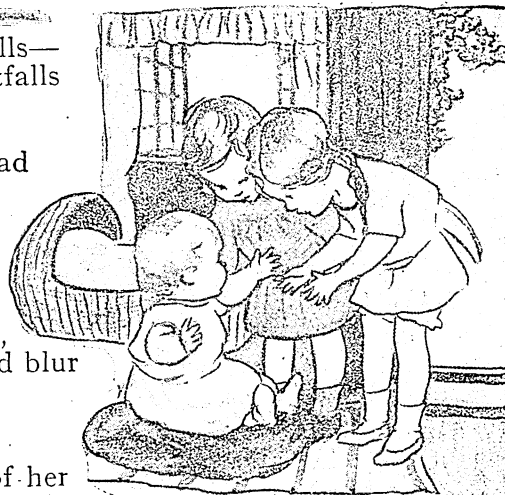
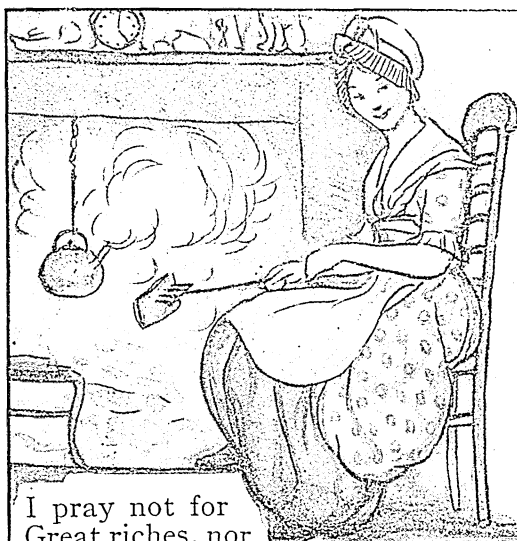


Ike Walton's Prayer

I CRAVE, dear Lord,
No boundless hoard
Of gold and gear,
Nor jewels fine,
Nor lands, nor kine,
Nor treasure-heaps of anything.
Let but a little hut be mine,
Where at the hearthstone I may hear
The cricket sing,
And have the shine
Of one glad woman's eyes to make,
For my poor sake,
Our simple home a place divine;
Just the wee cot—the cricket's chirr—
Love, and the smiling face of her.

I pray not for
Great riches, nor
For vast estates and castle-halls—
Give me to hear the bare footfalls
Of children o'er
An oaken floor
New-rinsed with sunshine, or bespread
With but the tiny coverlet
And pillow for the baby's head;
And, pray Thou, may
The door stand open, and the day
Send ever in a gentle breeze,
With fragrance from the locust-trees,
And drowsy moan of doves, and blur
Of robin-chirps, and drone of bees,
With after-hushes of the stir
Of intermingling sounds, and then
The good wife and the smile of her
Filling the silences again—
The cricket's call
And the wee cot,
Dear Lord of all;
Deny me not!

I pray not that
Men tremble at
My power of place
And lordly sway—
I only pray for simple grace
To look my neighbour in the face
Full honestly from day to day—
Yield me his horny palm to hold,
And I'll not pray
For gold :
The tanned face, garlanded with mirth,
It hath the kingliest smile on earth :
The swart brow, diamonded with sweat,
Hath never need of coronet.
And so I reach,
Dear Lord, to Thee,
And do beseech
Thou givest me
The wee cot, and the cricket's chirr—
Love, and the glad, sweet face of her!



The Twins

WE'RE the Twins from Aunt Marinn's,
Igo and Ago.

When Dad comes the show begins—
Iram, coram, dago.

Dad, he says he named us two
Igo and Ago

For a poem he always knew,
Iram, coram, dago.

Then he was a braw Scotchman—
Igo and Ago.

Now he's Scotch-Amer-i-can,
Iram, coram, dago.

"Hey!" he cries, and pats his knee,
"Igo and Ago,

My twin bairnies, ride wi' me—
Iram, coram, dago."

"Here," he laughs, "ye've each a leg,
Igo and Ago,

Gleg as Tam o' Shanter's 'Meg'
Iram, coram, dago."

Then we mount, with shrieks of mirth,
Igo and Ago,

The two gladdest twins on earth,
Iram, coram, dago.

Wade and Silas Walker cry,
"Igo and Ago—

Annie's kissin' 'em good-bye!"
Iram, coram, dago.

Auntie waves us fond farewells—
"Igo and Ago";

Granny pipes, "Tak care yersels!"
Iram, coram, dago.



The Prayer Perfect

DEAR Lord! kind Lord!
Gracious Lord! I pray

Thou wilt look on all I love
Tenderly today!

Weed their hearts of weariness;
Scatter every care

Down a wake of angel-wings
Winnowing the air.

Bring unto the sorrowing
All release from pain;

Let the lips of laughter
Overflow again;

And with all the needy
O divide, I pray,

This vast treasure of content
That is mine today!

If I Knew What Poets Know

If I knew what poets know,
Would I write a rhyme
Of the buds that never blow
In the summer-time?
Would I sing of golden seeds
Springing up in ironweeds?
And of raindrops turned to snow—
If I knew what poets know?

Did I know what poets do,
Would I sing a song
Sadder than the pigeon's coo
When the days are long?
Where I found a heart in pain
I would make it glad again;
And the false should be the true,
Did I know what poets do.

If I knew what poets know,
I would find a theme
Sweeter than the placid flow
Of the fairest dream:
I would sing of love that lives
On the errors it forgives;
And the world would better grow
If I knew what poets know.

Let Something Good Be Said

WHEN over the fair fame of friend or foe
The shadow of disgrace shall fall; instead
Of words of blame, or proof of thus and so,
Let something good be said.

Forget not that no fellow-being yet
May fall so low but love may lift his head;
Even the cheek of shame with tears is wet
If something good be said.

No generous heart may vainly turn aside
In ways of sympathy; no soul so dead
But may awaken strong and glorified
If something good be said.

And so I charge ye, by the thorny crown,
And by the Cross on which the Saviour bled,
And by your own soul's hope of fair renown,
Let something good be said!

POETRY

WE PLOUGH THE FIELDS AND SCATTER

Some of the best-known hymns have been translated from German into English. This hymn of gratitude was written in 1782 by Matthias Claudius, a German journalist, who died in 1815. The translator was Miss Jane Montgomery Campbell, a country vicar's daughter, who selected these three verses from many more as suitable for the children to sing in school. The tune to which the hymn is sung is also German, by J. A. E. Schultze. The hymn well deserves the popularity it has attained throughout the world.

WE plough the fields, and scatter
The good seed on the land,
But it is fed and watered
By God's Almighty Hand ;
He sends the snow in winter,
The warmth to swell the grain,
The breezes and the sunshine,
And soft refreshing rain.
All good gifts around us
Are sent from Heaven above,
Then thank the Lord, O thank the
Lord,
For all His love.

He only is the Maker
Of all things near and far ;
He paints the wayside flower,
He lights the evening star.
The winds and waves obey Him,
By Him the birds are fed ;
Much more to us, His children,
He gives our daily bread.
All good gifts around us
Are sent from Heaven above,
Then thank the Lord, O thank the
Lord,
For all His love.

We thank Thee, then, O Father,
For all things bright and good,
The seed-time and the harvest,
Our life, our health, our food.
Accept the gifts we offer
For all Thy love in parts,
And, what Thou most desirest,
Our humble, thankful hearts.
All good gifts around us
Are sent from Heaven above,
Then thank the Lord, O thank the
Lord,
For all His love.

THE TOYS

This poem, tender and wise, is one of the best written by Coventry Patmore (1823-1896), a poet whose domestic poems had considerable popularity during his lifetime.

My little son, who looked from thoughtful eyes
— And moved and spoke in quiet grown-up wise,
Having my law the seventh time disobeyed,

I struck him, and dismissed
With hard words and unkindness,
His mother, who was patient, being dead.
Then, fearing lest his grief should hinder sleep,
I visited his bed,
But found him slumbering deep,
With darkened eyelids, and their lashes yet
From his late sobbing wet.
And I, with moan,
Kissing away his tears, left others of my own ;
For, on a table drawn beside his head,
He had put, within his reach,
A box of counters and a red-veined stone,
A piece of glass abraded by the beach,
And six or seven shells,
A bottle with bluebells,
And two French copper coins, ranged there with careful art,
To comfort his sad heart.
So when that night I prayed
To God, I wept, and said :
Ah! when at last we lie with tranced breath,
Not vexing Thee in death,
And Thou rememberest of what toys
We made our joys,
How weakly understood
Thy great commanded good,
Then, fatherly not less
Than I whom Thou hast moulded from the clay,
Thou'lt leave Thy wrath, and say,
" I will be sorry for thy childishness."

TRIPLETS OF LITTLES

Here is a neat example of the quaintness of Robert Herrick as a rhymester. Each triplet of little things ends with one personal to the poet, and suiting his simple life. His small pipe means his trifling song, the reference being to the pipe on which shepherds used to play to wile away the hours.

A LITTLE saint best fits a little shrine,
A little prop best fits a little vine ;
As my small cruse best fits my little wine.

A little seed best fits a little soil,
A little trade best fits a little toil ;
As my small jar best fits my little oil.

A little bin best fits a little bread,
A little garland fits a little head ;
As my small stuff best fits my little shed.

A little hearth best fits a little fire,
A little chapel fits a little choir ;
As my small bell best fits my little spire.

A little stream best fits a little boat,
A little lead best fits a little float ;
As my small pipe best fits my little note.

POETRY

THE FAIRIES OF CALDON-LOW

This poem, by Mary Howitt, sets forth an old legend which tells us of wonderful things seen on a midsummer night on the top of a hill which is supposed to be a favourite haunt of the fairies. As boys and girls cannot get out at midnight to see these things, they have to dream about them instead, and that is why fairies continue to live; they will live just as long as boys and girls have fancy and imagination.

*AND where have you been, my Mary,
And where have you been from me?
I've been to the top of Caldon-Low,
The midsummer night to see!*

*And what did you see, my Mary,
All up on the Caldon-Low?
I saw the glad sunshine come down,
And I saw the merry winds blow.*

*And what did you hear, my Mary,
All up on the Caldon-Hill?
I heard the drops of the water made,
And I heard the green corn fill.*

*Oh, tell me all, my Mary,
All, all that ever you know:
For you must have seen the fairies
Last night on the Caldon-Low!*

*Then take me on your knee, mother,
And listen, mother of mine:
A hundred fairies danced last night,
And the harpers they were nine.*

*And the harp-strings rang so merrily
To their dancing feet so small;
But, oh! the sound of their talking
Was merrier far than all!*

*And what were the words, my Mary,
That you did hear them say?
I'll tell you all, my mother,
But let me have my way.*

*And some they played with the water,
And rolled it down the hill;
And this, they said, shall speedily turn
The poor old miller's mill.*

*For there has been no water
Ever since the first of May,
And a busy man will the miller be
At the dawning of the day!*

*Oh! the miller, how he will laugh
When he sees the mill-dam rise!
The jolly old miller, how he will laugh,
Till the tears fill both his eyes!*

*And some they seized the little winds
That sounded over the hill,
And each put a horn into his mouth
And blew both sharp and shrill.*

*And there, said they, the merry winds go
Away from every horn;
And these shall clear the mildew dank
From the blind old widow's corn.*

*Oh, the poor blind widow,
Though she has been blind so long,
She'll be merry enough when the mildew's
gone,
And the corn stands stiff and strong!*

*And some they brought the brown
linseed
And flung it down the Low;
And this, said they, by the sunrise
In the weaver's croft shall grow!*

*Oh, the poor lame weaver!
How will he laugh outright
When he sees his dwindling flax-field
All full of flowers by night!*

*And then outspoke a brownie
With a long beard on his chin:
I have spun up all the tow, said he,
And I want some more to spin.*

*I've spun a piece of hempen cloth,
And I want to spin another:
A little sheet for Mary's bed,
And an apron for her mother!*

*And with that I could not help but laugh,
And I laughed out loud and free;
And then on the top of Caldon-Low
There was no one left but me.*

*And all on the top of Caldon-Low
The mists were cold and gray,
And nothing I saw but the mossy stones
That round about me lay.*

*But as I came down from the hill-top
I heard, afar below,
How busy the jolly miller was,
And how meriy the wheels did go!*

*And I peeped into the widow's field,
And, sure enough, was seen
The yellow ears of the mildew corn
All standing stiff and green.*

*And down the weaver's croft I stole,
To see if the flax were high;
But I saw the weaver at his gate
With the good news in his eye!*

*Now, this is all I heard, mother,
And all that I did see;
So, prithee, make my bed, mother,
For I'm tired as I can be!*

THE CURFEW BELL

This is an American schoolgirl's version of an English legend associated with the parish church of Chertsey. It is not good poetry: it is badly constructed; but we give it because it is often recited owing to the interest of its story—though even this is wrongly told. The writer was Rose Hartwick, born in Indiana on July 18, 1850. Eight years before her birthday Albert Smith had embodied in a play the legend of a girl who saved her lover's life by clinging to the clapper of the bell which was to sound the hour of his execution, and the play, called *Blanche Heriot*, was produced at the Surrey Theatre. During the Wars of the Roses Blanche's lover, Neville, had been captured by the Yorks, but was reprieved. The reprieve was late in coming, and Blanche delayed the execution by holding the clapper of the bell. In this version of the story Rose Hartwick changed the name of Blanche to Bessie, and staged the incident in the Civil War with Cromwell as the granter of the pardon; but, as a matter of fact, Cromwell had nothing whatever to do with it.

SLOWLY England's sun was setting o'er
the hilltops far away,
Filling all the land with beauty at the close
of one sad day;

And its last rays kissed the forehead of a
man and maiden fair,
He with steps so slow and weary, she with
sunny, floating hair;
He with bowed head, sad and thoughtful,
she, with lips so cold and white,
Struggled to keep back the murmur:
Curfew must not ring tonight!

"Sexton," Bessie's white lips faltered,
pointing to the prison old,
With its turrets tall and gloomy, with its
walls, dark, damp, and cold,
"I've a lover in that prison, doomed this
very night to die
At the ringing of the curfew, and no earthly
help is nigh.
Cromwell will not come till sunset," and
her lips grew strangely white
As she spoke in husky whispers: "Curfew
must not ring tonight!"

"Bessie," calmly spoke the sexton (every
word pierced her young heart
Like the piercing of an arrow, like a
deadly poisoned dart),
"Long, long years I've rung the curfew
from that gloomy, shadowed tower;
Every evening, just at sunset, it has tolled
the twilight hour.
I have done my duty ever, tried to do it
just and right;
Now I'm old I will not falter. Curfew
bell must ring tonight!"

—Wild her eyes and pale her features, stern
and white her thoughtful brow,
As within her secret bosom Bessie made
a solemn vow.

She had listened while the judges read,
without a tear or sigh:
"At the ringing of the curfew Basil
Underwood must die."
And her breath came fast and faster, and
her eyes grew large and bright;
In an undertone she murmured: "Curfew
must not ring tonight!"

She with quick step bounded forward,
sprang within the old church door;
Left the old man treading slowly paths
he'd trod so oft before.
Not one moment paused the maiden, but,
with cheek and brow aglow,
Mounted up the gloomy tower, where the
bell swung to and fro;
Then she climbed the slimy ladder, on
which fell no ray of light,
Up and up, her white lips saying: "Curfew
shall not ring tonight!"

She had reached the topmost ladder; o'er
her hangs the great, dark bell;
Awful is the gloom beneath her, like the
pathway down to hell.
See! the ponderous tongue is swinging;
'tis the hour of curfew now,
And the sight has chilled her bosom, stopped
her breath, and paled her brow.
Shall she let it ring? No, never! Flash her
eyes with sudden light
As she springs, and grasps it firmly:
"Curfew shall not ring tonight!"

Out she swung—far out; the city seemed
a speck of light below,
There 'twixt heaven and earth suspended,
as the bell swung to and fro.
And the half deaf sexton ringing (years he
had not heard the bell),
Sadly thought that twilight curfew rang
young Basil's funeral knell.
Still the maiden clung more firmly, and
with trembling lips so white
Said to hush her heart's wild throbbing,
"Curfew shall not ring tonight!"

It was o'er; the bell ceased swaying; and
the maiden stepped once more
Firmly on the damp old ladder, where for
hundred years before
Human foot had not been planted. But
the brave deed she had done
Should be told long ages after. As the
rays of setting sun
Crimson all the sky with beauty, aged
sires, with heads of white,
Tell the children why the curfew did not
ring that one sad night.

O'er the distant hills comes Cromwell.
 Bessie sees him ; and her brow,
 Lately white with sickening horror, has no
 anxious traces now.
 At his feet she tells her story, shows her
 hands all bruised and torn ;
 And her face so sweet and pleading, yet
 with sorrow pale and worn,
 Touched his heart with sudden pity, lit his
 eyes with misty light.
 "Go ! Your lover lives !" cried Cromwell.
 "Curfew shall not ring tonight !"

Wide they flung the massive portal, led the
 prisoner forth to die,
 All his bright young life before him.
 'Neath the darkening English sky
 Bessie came, with flying footsteps, eyes
 aglow with love-light sweet ;
 Kneeling on the turf beside him, laid his
 pardon at his feet.
 In his brave, strong arms he clasped her,
 kissed the face upturned and white,
 Whispered : "Darling, you have saved me ;
 curfew will not ring tonight !"

HOME THOUGHTS IN LAVENTIE

The writer of this delightful sketch from the midst of
 grim war, Edward Wyndham Tennant of the Grenadier
 Guards, was one of the rarest spirits released from the
 Earth during the appalling struggle of the Great War. As a
 child he showed qualities that promised genius. As a young
 soldier he was beloved by his regiment. He took the spirit
 of joy with him everywhere. He gathered it, as this poem
 shows, from all life's simpler beauties. He was killed on the
 Somme, being the victim of a German sniper's bullet.

GREEN gardens in Laventie !
 Soldiers only know the street
 Where the mud is churned and splashed
 about
 By battle-wending feet ;
 And yet beside one stricken house there
 is a glimpse of grass,
 Look for it when you pass.

Beyond the Church, whose pitted spire
 Seems balanced on a strand
 Of swaying stone and tottering brick,
 Two roofless ruins stand,
 And here behind the wreckage where the
 back wall should have been
 We found a garden green.

The grass was never trodden on,
 The little path of gravel
 Was overgrown with celandine ;
 No other folk did travel
 Along its weedy surface but the nimble-
 footed mouse
 Running from house to house.

So all among the vivid blades
 Of soft and tender grass
 We lay, nor heard the limber wheels
 That pass and ever pass,
 In noisy continuity until their stony rattle
 Seems in itself a battle.

At length we rose up from this ease
 Of tranquil happy mind,
 And searched the garden's little length
 A fresh pleasance to find ;
 And there some yellow daffodils and
 jasmine hanging high
 Did rest the tired eye.

The fairest and most fragrant
 Of the many sweets we found
 Was a little bush of Daphne flower
 Upon a grassy mound,
 And so thick were the blossoms set and so
 divine the scent
 That we were well content.

Hungry for Spring, I bent my head,
 The perfume fanned my face,
 And all my soul was dancing
 In that lovely little place,
 Dancing with a measured step from
 wrecked and shattered towns
 Away . . . upon the Downs.

I saw green banks of daffodil,
 Slim poplars in the breeze,
 Great tan-brown hares in gusty March
 A-couching on the leas ;
 And meadows with their glittering streams,
 and silver scurrying dace,
 Home—what a perfect place !

I THINK ON THEE

Here are the first two verses of a love song typical of the
 early nineteenth century. The writer was Thomas K.
 Hervey, an editor, born in Scotland in 1799, who practised
 journalism in London for nearly 40 years

I THINK on thee in the night,
 When all beside is still,
 And the moon comes out, with her pale,
 sad light,
 To sit on the lonely hill ;
 When the stars are all like dreams,
 And the breezes all like sighs,
 And there comes a voice from the far-off
 streams,
 Like thy spirit's low replies.

I think on thee by day,
 'Mid the cold and busy crowd,
 When the laughter of the young and gay
 Is far too glad and loud !
 I hear thy soft, sad tone,
 And thy young sweet smile I see :
 My heart—my heart were all alone
 But for its dreams of thee !

POETRY

KUBLA KHAN

This strange poem, left by Samuel Taylor Coleridge as a fragment, with its promise of being a mighty masterpiece of imagination, has a curious history. The poet was unwell, and after taking a dose of opium he fell asleep in his chair for three hours. Just as he lost consciousness he was reading how Kubla Khan commanded a palace to be built with a stately garden. With sleep came this dream-poem about the palace, and the moment the poet awoke he hastily seized pen and paper and wrote it down till he was interrupted by a visitor calling. When, after an hour, he tried to resume writing the dream-poem it had faded from his memory. Before it was forgotten the poem was about four times its present length. Coleridge never tried to resume its weird conceptions and lovely phrasings; and we can only imagine from this fragment what the world lost through a visitor's untimely call on the poet.

IN Xanadu did Kubla Khan
A stately pleasure-dome decree :
Where Alph, the sacred river, ran
Through caverns measureless to man
Down to a sunless sea.
So twice five miles of fertile ground
With walls and towers were girdled round :
And there were gardens bright with
sinuous rills,
Where blossomed many an incense-bearing
tree ;
And here were forests ancient as the hills,
Enfolding sunny spots of greenery.
But O, that deep romantic chasm which
slanted
Down the green hill athwart a cedarn cover!
A savage place! as holy and enchanted
As e'er beneath a waning moon was
haunted
By woman wailing for her demon-lover!
And from this chasm, with ceaseless tur-
moil seething,
As if this earth in fast thick pants were
breathing,
A mighty fountain momentarily was forced ;
Amid whose swift half-intermitted burst
Huge fragments vaulted like rebounding
hail,
Or chaffy grain beneath the thresher's flail :
And 'mid these dancing rocks at once and
ever
It flung up momentarily the sacred river.
Five miles meandering with a mazy motion
Through wood and dale the sacred river ran,
Then reached the caverns measureless to
man,
And sank in tumult to a lifeless ocean :
And 'mid this tumult Kubla heard from far
Ancestral voices prophesying war !
The shadow of the dome of pleasure
Floated midway on the waves ;
Where was heard the mingled measure
From the fountain and the caves.
It was a miracle of rare device,
A sunny pleasure-dome with caves of ice !

A damsel with a dulcimer
In a vision once I saw :
It was an Abyssinian maid,
And on her dulcimer she played,
Singing of Mount Abora.
Could I revive within me
Her symphony and song,
To such a deep delight 'twould win
me
That with music loud and long
I would build that dome in air,
That sunny dome ! those caves of ice !
And all who heard should see them
there,
And all should cry, Beware ! Beware !
His flashing eyes, his floating hair !
Weave a circle round him thrice,
And close your eyes with holy dread,
For he on honey-dew hath fed,
And drunk the milk of Paradise.

IT IS A BEAUTEOUS EVENING

This exquisite sonnet was written on the beach at Calais by Wordsworth in the autumn of 1802, as he paused there on his return from family business in France. The description of the evening's tranquillity and of his girl companion's simplicity vie with each other in their beauty.

IT is a beauteous evening, calm and free,
The holy time is quiet as a nun
Breathless with adoration ; the broad sun
Is sinking down in its tranquillity ;
The gentleness of heaven broods o'er the
sea :
Listen ! the mighty being is awake,
And doth with his eternal motion make
A sound like thunder—everlastingly.
Dear child ! dear girl ! that walkest with
me here,
If thou appear untouched by solemn
thought,
Thy nature is not therefore less divine :
Thou liest in Abraham's bosom all the
year ;
And worshipping'st at the Temple's inner
shrine,
God being with thee when we know it not.

TO ROBIN REDBREAST

Perhaps the quaintest, and certainly the most musical, of epitaphs is this, asked as a favour from Robin Redbreast by Robert Herrick, the Devonshire parson poet.

LAID out for dead, let thy last kindness
be
With leaves and moss-work for to cover
me :
And while the wood-nymph's my cold
corpse inter
Sing thou my dirge, sweet-warbling
chorister !
For epitaph, in foliage, next write this :
Here, here the tomb of Robin Herrick is.

AWAY, AWAY, FROM MEN AND TOWNS

This is a part of an invitation written by Shelley to a friend to accompany him into the forest near Pisa, while he ceases to mope and leaves care behind under Nature's influence.

AWAY, away, from men and towns,
To the wild wood and the downs,
To the silent wilderness
Where the soul need not repress
Its music lest it should not find
An echo in another's mind,
While the touch of Nature's art
Harmonises heart to heart.
I leave this notice on my door
For each accustomed visitor:
"I am gone into the fields
To take what this sweet hour yields.
Reflection, you may come tomorrow;
Sit by the fireside with Sorrow.
Expectation, too, be off!
Today is for itself enough."

INSIDE KING'S COLLEGE CHAPEL

With the exception of a short poem on the skylark, these three sonnets are the latest writings in which William Wordsworth sustained his high reputation as a poet. They were written in 1820 at 50. It seems as if a visit to Cambridge, the university of his student days, had relit in him the spark of genius. The descriptions of the architecture of the college chapel and its music are only surpassed by the noble outburst with which the third sonnet opens, and leads up to the monumental national shrines of Westminster Abbey and St. Paul's Cathedral.

TAX not the royal saint with vain
expense,
With ill-matched aims the architect who
planned—
Albeit labouring for a scanty band
Of white-robed scholars only—this
immense
And glorious work of fine intelligence!
Give all thou canst; high Heaven rejects
the lore
Of nicely-calculated less or more;
So deemed the man who fashioned for the
sense
These lofty pillars, spread that branching
roof
Self-poised, and scooped into ten thousand
cells,
Where light and shade repose, where
music dwells
Lingering, and wandering on as loth to
die;
Like thoughts whose very sweetness
yieldeth proof
That they were born for immortality.

What awful perspective! while from our
sight
With gradual stealth the lateral windows
hide

Their portraitures, their stone-work
glimmers, dyed
In the soft chequerings of a sleepy light.
Martyr, or King, or sainted Eremite,
Whoe'er ye be that thus, yourselves
unseen,
Imbue your prison-bars with solemn
sheen,
Shine on, until ye fade with coming night!
But, from the arms of silence, list! O list!
The music bursteth into second life;
The notes luxuriate, every stone is kissed
By sound, or ghost of sound, in mazy
strife;
Heart-thrilling strains, that cast, before
the eye
Of the devout, a veil of ecstasy!

They dreamt not of a perishable home
Who thus could build. Be mine, in hours of
fear
Or grovelling thought, to seek a refuge here;
Or through the aisles of Westminster to
roam;
Where bubbles burst, and folly's dancing
foam
Melts if it cross the threshold; where the
wreath
Of awe-struck wisdom droops: or let my
path
Lead to that younger pile, whose sky-like
dome
Hath typified by reach of daring art
Infinity's embrace; whose guardian crest,
The silent Cross, among the stars shall
spread
As now, when She hath also seen her breast
Filled with mementos, satiate with its
part
Of grateful England's overflowing dead.

NONE IS LORD OF ALL

In these eight lines there is a kind of argument, or counter-challenge, in couplets. The first two lines argue that change is best. No, reply the next two lines; we well might have more pleasure of the kinds of which we do not grow weary. But, say lines five and six, change is best. Nay, reply lines seven and eight, we want nothing better and more delightful than perpetual spring.

THE rarer pleasure is it is more sweet,
And friends are kindest when they
seldom meet.
Who would not hear the nightingale still
sing,
Or who grow ever weary of the spring?
The day must have her night, the spring
her fall;
All is divided, none is lord of all.
It were a most delightful thing
To live in a perpetual spring.

A THANKSGIVING FOR HIS HOUSE

Robert Herrick, one of the cleverest of England's lyrical writers, was a merry man about town, known as a writer of many a cheerful lay, when he was made a parson in his thirty-eighth year. He lived eighteen years in Devonshire, but was turned out of his vicarage for fifteen years by the Puritans. He resumed his pastoral duties for twelve more years, when the Restoration brought his party into power. His verses are about equally divided between religious subjects, country scenes, and love songs. The Thanksgiving is a happy example of his quaint style, and suggests a genuine thankfulness for homely blessings.

LORD, Thou hast given me a cell
Wherein to dwell;
A little house, whose humble roof
Is weather-proof;
Under the spars of which I lie
Both soft and dry;
Where Thou my chamber for to ward
Hast set a guard
Of harmless thoughts, to watch and keep
Me while I sleep.
Low is my porch, as is my fate,
Both void of state;
And yet the threshold of my door
Is worn by the poor,
Who thither come, and freely get
Good words or meat;
Like as my parlour, so my hall
And kitchen's small;
A little buttery, and therein
A little bin
Which keeps my little loaf of bread
Unchipped, unlead.
Some brittle sticks of thorn or briar
Make me a fire,
Close by whose living coal I sit,
And glow like it.
Lord, I confess, too, when I dine,
The pulse is Thine,
And all those other bits that be
There placed by Thee;
The worts, the purslain, and the mess
Of water-cress,
Which of Thy kindness Thou hast sent;
And my content
Makes those and my beloved beet
To be more sweet.
'Tis Thou that crown'st my glittering
hearth
With guiltless mirth;
And giv'st me wassail bowls to drink,
Spiced to the brink.
Lord, 'tis Thy plenty-dropping hand
That soils my land;
And giv'st me for my bushel sown
Twice ten for one.
That mak'st my teeming hen to lay
Her egg each day;
Besides my healthful ewes to bear
Me twins each year,

The while the conduits of my kine
Run cream (for wine).
All these, and better, Thou dost send
Me to this end,
That I should render, for my part,
A thankful heart;
Which, fired with incense, I resign
As wholly Thine;
But the acceptance, that must be,
My Christ, by Thee.

THE WAR SONG OF DINAS VAWR

As a bare, blunt telling of the brutality of war, which so many poets have hidden under romance, this war song by Thomas Love Peacock stands alone. Peacock's best verses were scattered through his novels. Like Charles Lamb, Peacock was an East India Company's clerk; but he quite understood the savage relish of primitive man.

THE mountain sheep are sweeter,
But the valley sheep are fatter;
We therefore deemed it meet
To carry off the latter.
We made an expedition;
We met an host and quelled it;
We forced a strong position,
And killed the men who held it.
On Dyfed's richest valley,
Where herds of kine were browsing,
We made a mighty sally,
To furnish our carousing.
Fierce warriors rushed to meet us;
We met them, and o'erthrew them;
They struggled hard to beat us,
But we conquered them, and slew them.
As we drove our prize at leisure
The king marched forth to catch us;
His rage surpassed all measure,
But his people could not match us.
He fled to his hall-pillars;
And, ere our force we led off,
Some sacked his house and cellars,
And others cut his head off.
We there, in strife bewild'ring,
Spilt blood enough to swim in,
We orphaned many children,
And widowed many women.
The eagles and the ravens
We glutted with our foemen;
The heroes and the cravens,
The spearmen and the bowmen.
We brought away from battle,
And much their land bemoaned them,
Two thousand head of cattle,
And the head of him who owned them:
Ednyfed, King of Dyfed,
His head was borne before us;
His wine and beasts supplied our feasts,
And his overthrow our chorus.

THE WORD OF GOD TO LEYDEN CAME

This homely example of colloquial verse, by Jeremiah Eames Rankin, a Congregational minister and hymn-writer of the United States, born in 1828, tells how the Pilgrim Fathers founded the colony of Massachusetts that they might have freedom to worship God. They had been driven by persecution from England to Holland, whence they sailed for the New World, touching only at Plymouth. The robustness of sentiment helps us to forgive the commonplace verse.

THE word of God to Leyden came,
Dutch town by Zuyder Zee ;
Rise up, My children of no name,
My kings and priests to be.
There is an empire in the West,
Which I will soon unfold ;
A thousand harvests in her breast,
Rocks ribbed with iron and gold.

Rise up, My children, time is ripe !
Old things are passed away ;
Bishops and kings from earth I wipe :
Too long they've had their day.
A little ship have I prepared
To bear you o'er the seas ;
And in your souls My will declared
Shall grow by slow degrees.

Beneath My throne the martyrs cry :
I hear their voice, How long ?
It mingles with their praises high,
And with their victor song.
The thing they longed and waited for,
But died without the sight,
So this shall be ! I wrong abhor,
The world I'll now set right.

Leave, then, the hammer and the loom,
You've other work to do ;
For Freedom's commonwealth there's room,
And you shall build it too.
I'm tired of bishops and their pride,
I'm tired of kings as well ;
Henceforth I take the people's side,
And with the people dwell.

Tear off the mitre from the priest,
And from the king his crown ;
Let all my captives be released ;
Lift up whom men cast down.
Their pastors let the people choose,
And choose their rulers too ;
Whom they select I'll not refuse,
But bless the work they do.

The Pilgrims rose at this, God's word,
And sailed the wintry seas ;
With their own flesh nor blood conferred,
Nor thought of wealth or ease.
They left the towers of Leyden town,
They left the Zuyder Zee ;
And where they cast their anchor down
Rose Freedom's realm to be.

HOME

These lines by James Montgomery, the hymn-writer, are taken from a long poem on the West Indies. In them the poet, in moving words, claims for each nation the belief that its native land is peculiarly favoured by Heaven. He also suggests that in that land each man's home is the sweetest spot of all. Broadly speaking, the claim is true, but many men have willingly adopted a country not their own ; and there are languages with no word like the English word Home.

THERE is a land, of every land the
pride,
Beloved by Heaven o'er all the world
beside,
Where brighter suns dispense serener light,
And milder moons emparadise the night ;
A land of beauty, virtue, valour, truth,
Time-tutored age, and love-exalted youth :
The wandering mariner, whose eye explores
The wealthiest isles, the most enchanting
shores,
Views not a realm so bountiful and fair,
Nor breathes the spirit of a purer air ;
In every clime the magnet of his soul,
Touched by remembrance, trembles to
that pole.

For in this land of Heaven's peculiar grace,
The heritage of Nature's noblest race,
There is a spot of earth supremely blest,
A dearer, sweeter spot than all the rest,
Where man, creation's tyrant, casts aside
His sword and sceptre, pageantry and
pride,
While in his softened looks benignly blend
The sire, the son, the husband, brother,
friend ;

Here woman reigns ; the mother, daughter,
wife,
Strews with fresh flowers the narrow way
of life !

In the clear heaven of her delightful eye
An angel-guard of loves and graces lie ;
Around her knees domestic duties meet,
And fireside pleasures gambol at her feet.
Where shall that land, that spot of earth
be found ?

Art thou a man ?—a patriot ?—look
around ;
O, thou shalt find, howe'er thy footsteps
roam,
That land thy country, and that spot thy
Home.

OUTWITTED

How shall we treat those who reject us as beyond their bounds ? Here is the answer by Edwin Markham, the American poet. Though their outlook is too narrow to include us, ours need not be too narrow to include them. That, too, is the lesson that human love teaches us.

HE drew a circle that shut me out,
Heretic, rebel, a thing to flout.
But I love and I had the wit to win ;
We drew a circle that took him in !

SONGS FROM SHAKESPEARE

WHO IS SYLVIA?

Words from Two Gentlemen of Verona

Music by Schubert

In moderate time

pp

1. Who is Syl - via, what is she?... That
 2. Is she kind..... as she's fair?... For
 3. Then to Syl - via let us sing,... That

all our swains com - mend her. Ho - ly,
 beau - ty lives with kind - ness: Love doth
 Syl - via is ex - cel - ing; She ex -

fair,..... and wise is she,..... The heav'n's such grace did
 to,..... her eyes re - pair,..... To help him of his
 cels..... each mor - tal thing,.... Up - on the dull earth

lend..... her; That ad - mir - ed
 blind - ness; And, being help'd,
 dwell - ing; Let us gar - lands

pp

SONGS FROM SHAKESPEARE

she might be, That ad
In habits there, And, being
to her... bring,.... us

mf

mir ed she might be.
help'd, in she hab its.... there.
gar lands to her... bring.

A LOVER AND HIS LASS

Words from As You Like It

Music by Thomas Morley

Allegretto *poco rall.* *mf a tempo.*

1. It was a lov - er and his lass,
2. This ca - rol they be - gan that hour, with a
3. Then pret - ty lov - ers take the time,

hey, with a ho, with a hey..... no - ni - no, and a hey..... no - ni no, ni -

no. } That o'er the green corn-field did pass,
How that life was but a flower
For love is crown-ed with the prime } In Spring Time, in Spring Time, in Spring Time, The

SONGS FROM SHAKESPEARE

on - ly pret - ty ring time, When birds do sing— hey ding a ding a ding, hey
ding a ding a ding, hey ding a ding a ding, Sweet lov - ers love the Spring.

O, WILLOW, WILLOW

Words from Othello

Traditional Air

Andante
A poor soul sat sigh - ing by a syc - a - more tree, Sing
He sighed in his sigh - ing and..... made a great moan, Sing
wil - low, wil - low, wil - low, With his hand in his bo - som and his head up - on his
wil - low, wil - low, wil - low, I am dead to all plea - sure, my true love she is
knee ! } Oh ! wil - low, wil - low, wit - low, wil - low ! Oh ! wil - low, wil - low, wil - low, wil - low my
gone. }
gar - land shall be, Sing all a green wil - low, wil - low, wil - low,
wil - low, Ah ! me..... the green wil - low my gar - land must be.
mp poco rall.

WHEN I WAS A TINY BOY

Words from Twelfth Night

Traditional Air

In moderate time

p

mf

When that I was a lit-tle ti-ny boy, With a heigh! ho! the wind and the rain, A

fool-ish thing was but a toy, For the rain it rain-eth ev-'ry day, With a

cres.

f

heigh! ho! the wind and the rain, For the rain it rain-eth ev-'ry day.

Ped. *

COME UNTO THESE YELLOW SANDS

Words from The Tempest

Music by Purcell

p

Come un-to these yel-low sands, And there take hands; Foot it feat-ly,

CHORUS

f

here and there, And let the rest the bur-den bear. Hark! Hark! the watch-dogs bark;

mf

Hark! Hark! I hear the strain of chan-ti-cleer, Hark! Hark! I hear the strain of chan-ti-cleer.

LITTLE VERSES FOR VERY LITTLE PEOPLE

JACK SPRAT AND HIS WIFE

Some verses of this poem have appeared in this book on page 5052. Here we give the complete poem

JACK SPRAT could eat no fat,
His wife could eat no lean,
And so between them both
They licked the platter clean.

Jack ate all the lean,
Joan ate all the fat,
The bone they both picked clean,
Then gave it to the cat.

When Jack Sprat was young
He dressed very smart,
He courted Joan Cole,
And soon gained her heart.

In his fine leather doublet
And an old greasy hat,
Oh, what a smart fellow
Was little Jack Sprat.

Joan Cole had a hole
In her petticoat,
Jack Sprat, for a patch,
To Joan gave a groat.

The groat bought a patch,
Which soon stopped the hole;
"I thank you, Jack Sprat,"
Says little Joan Cole.

Jack Sprat was the bridegroom,
Joan Cole was the bride,
Jack said from the church
His Joan home should ride.

But no coach could take her,
The lane was so narrow,
Said Jack, "Then I'll take her
Home in a wheelbarrow."

Jack Sprat was wheeling
His wife by the ditch,
The barrow turned over,
And in she did pitch.

Says Jack, "She'll be drowned,"
But Joan did reply,
"I don't think I shall,
For the ditch is quite dry."

Jack brought home his Joan,
And she sat in a chair,
When in came the cat,
That had got but one ear.

Says Joan, "I've come, puss,
Pray, how do you do?"
The cat wagged her tail,
And said nothing but "mew."

Jack Sprat took his gun
And went to the brook,
He shot at the drake,
But he quite killed the duck.

He brought it to Joan,
Who a fire did make
To roast the fat duck
While Jack went for the drake

The drake it was swimming
With his nice curly tail,
Jack Sprat came to shoot him,
But happened to fail.

He let off his gun,
But, missing his mark,
The drake flew away,
Crying "Quack, quack, quack,
quack!"

Jack Sprat to live pretty
Now bought him a pig,
It was not very little,
And not very big.

It was not very lean,
It was not very fat;
"It will serve for a grunter,"
Said little Jack Sprat.

Then Joan went to market
To buy her some fowls,
She bought a jackdaw
And a couple of owls.

The owls they were white,
The jackdaw was black;
"They make a fine lot,"
Said little Joan Sprat.

Jack Sprat bought a cow,
His Joan for to please,
For Joan she could make
Both butter and cheese,

Or pancakes or puddings,
Without any fat;
A notable housewife
Was little Joan Sprat.

Joan Sprat went to brewing
A barrel of ale,
She put in some hops
That it might not turn stale.

But as for the malt,
She forgot to put that;
"This is brave, sober liquor,"
Said little Jack Sprat

Jack Sprat went to market,
And bought him a mare,
She was lame in three legs,
And as blind as could stare.

LITTLE VERSES FOR VERY LITTLE PEOPLE

Her ribs they were bare,
For the mare had no fat ;
"She looks like a racer,"
Said little Jack Sprat.

Jack and Joan went abroad,
Puss took care of the house ;
She caught a large rat
And a very small mouse.

She caught a small mouse
And a very large rat.
"You're an excellent hunter,"
Said little Jack Sprat.

Now I've told you the story
Of little Jack Sprat,
And little Joan Cole,
And the poor one-eared cat.

Now Jack loved his Joan,
And good things he taught her.
She gave him a son,
And then, after, a daughter.

Now Jack has got rich
And has plenty of pelf,
If you know any more
You may tell it yourself.

THE BELLS OF LONDON TOWN

GAY go up, and gay go down,
To ring the bells of London town.

Bull's eyes and targets,
Say the bells of St. Margaret's.

Brickbats and tiles,
Say the bells of St. Giles.

Halfpence and farthings,
Say the bells of St. Martin's.

Oranges and lemons,
Say the bells of St. Clement's.

Pancakes and fritters,
Say the bells of St. Peter's.

Two sticks and an apple,
Say the bells of Whitechapel.

Old Father Baldpate,
Say the slow bells at Aldgate.

You owe me ten shillings,
Say the bells of St. Helen's.

Pokers and tongs,
Say the bells of St. John's.

Kettles and pans,
Say the bells of St. Anne's.

When will you pay me ?
Say the bells of Old Bailey.

When I grow rich,
Say the bells of Shoreditch.

Pray when will that be ?
Say the bells at Stepney.

I am sure I don't know,
Says the great bell at Bow.

Here comes a candle to light you to bed,
And here comes a chopper to chop off
your head.

MOSS WAS A LITTLE MAN

Moss was a little man, and a little mare
did buy,
For kicking and for sprawling none could
the mare come nigh.
She trotted and she ambled, and she can-
tered here and there,
But one dark night she strayed away, and
so Moss lost his mare.

Moss got up next morning to catch her
fast asleep,
And round about the frosty fields so
nimby he did creep.
Lying in a ditch he found her, and glad to
find her there,
So I'll tell you by and by how Moss caught
his mare.

"Rise, stupid, rise!" he thus to her
did say ;

"Arise, you lazy animal, get up without
delay,

For I must ride you to the town, so don't
lie sleeping there ;"

He put the halter round her neck, and so
Moss caught his mare.

OLD SUPERSTITIONS

CUT your nails on Monday, cut them for
news ;

Cut them on Tuesday, a pair of new shoes ;
Cut them on Wednesday, cut them for
health ;

Cut them on Thursday, cut them for
wealth ;

Cut them on Friday, cut them for woe ;
Cut them on Saturday, a journey you'll go ;
Cut them on Sunday, you'll cut them for
evil,

For all the next week you'll be ruled by
the devil.

MARRY Monday, marry for wealth ;
Marry Tuesday, marry for health ;
Marry Wednesday, the best day of all ;
Marry Thursday, marry for crosses ;
Marry Friday, marry for losses ;
Marry Saturday, no luck at all.

Imperishable Thoughts of Men Enshrined in the Books of the World

Milton's Masterpiece

JOHN MILTON'S *Paradise Lost* is the greatest epic poem in the English language. As an effort of sheer imagination it stands alone. Its conception is stupendous.

It pictures worlds the eye of man has never seen—worlds of angelic and of lost spirits existing before man's creation. It expands the drama of man's origin, and his fall from purity, as they are briefly outlined in the Bible. It thrills the reader by the majesty and power of its grander scenes, and melts his soul with pity in its human tenderness. Its literary charm is so perfect, when we catch its cadence, that it haunts the mind with an unfading beauty. This noble poem was planned in Milton's youth, but its actual writing was delayed till he was fifty. He began to write it in 1658, after he was blind, finished it in 1665, and published it in 1667. For it he received £10, and his widow received another £8 after his death in 1674. By it he achieved the immortal fame of which he had dreamed in his youth. We have already glanced at this poem on page 1355; here we trace the course of the whole poem, while illustrating its majesty and beauty by quoting the finest passages from its twelve books.

PARADISE LOST

THE poem opens with an invocation to the Heavenly Muse for enlightenment and inspiration.

Of Man's first disobedience, and the fruit
Of that forbidden tree whose mortal taste
Brought death into the World, and all our woe,
With loss of Eden, till one greater Man
Restore us, and regain the blissful seat,
Sing, Heavenly Muse, that, on the secret top
Of Oreb, or of Sinai, didst inspire
That Shepherd who first taught the chosen seed
In the beginning how the heavens and earth
Rose out of Chaos; or, if Sion hill
Delight thee more, and Siloa's brook that flowed
Fast by the oracle of God, I thence
Invoke thy aid to my adventurous song,
That with no middle flight intends to soar
Above the Aonian mount, while it pursues
Things unattempted yet in prose or rhyme.
And chiefly Thou, O Spirit, that dost prefer
Before all temples the upright heart and pure,
Instruct me, for Thou know'st; Thou from the
first

Wast present, and with mighty wings outspread,
Dove-like sat'st brooding on the vast Abyss,
And mad'st it pregnant: what in me is dark
Illumine, what is low raise and support;
That, to the highth of this great argument,
I may assert Eternal Providence,
And justify the ways of God to men.

Say first—for Heaven hides nothing from thy
view,

Nor the deep tract of Hell—say first what cause
Moved our grand Parents, in that happy state,

Favoured of Heaven so highly, to fall off
From their Creator, and transgress His will.

The infernal serpent; he it was whose guile,
Stirred up with envy and revenge, deceived
The mother of mankind, what time his pride
Had cast him out from Heaven, with all his host
Of rebel angels. Him the Almighty Power
Hurled headlong flaming from the ethereal sky,
With hideous ruin and combustion, down
To bottomless perdition, there to dwell
In adamant chains and penal fire,
Who durst defy the Omnipotent to arms.

For nine days and nights the apostate
Angel lay silent, "rolling in the fiery
gulf," and then, looking round, he
discerned by his side Beelzebub, "one
next himself in power and next in
crime." With him he took counsel,
and rearing themselves from off the pool
of fire they found footing on a dreary
plain. Walking with uneasy steps the
burning marle, the lost Archangel made
his way to the shore of that "inflamed
sea," and called aloud to his associates
to "Awake, arise, or be for ever fallen!"
They heard, and gathered about their chief,
but with looks "downcast and damp." He

Then straight commands that, at the warlike
sound

Of trumpets loud and clarions, be upreared
His mighty standard. That proud honour
claimed

ROMANCE · HISTORIES · DRAMAS · ESSAYS · WORLD CLASSICS

Azazel as his right, a cherub tall,
Who forthwith from the glittering staff unfurled
The imperial ensign
At which the universal host up-sent
A shout that tore Hell's concave, and beyond
Frighted the reign of Chaos and old Night.

The mighty host now circled in orderly
array about "their dread Commander."

He, above the rest
In shape and gesture proudly eminent,
Stood like a tower. His form had not yet lost
All her original brightness, nor appeared
Less than Archangel ruined, and the excess
Of glory obscured: as when the sun new-risen
Looks through the horizontal misty air
Shorn of his beams, or, from behind the moon,
In dim eclipse, disastrous twilight sheds
On half the nations, and with fear of change
Perplexes monarchs. Darkened so, yet shone
Above them all the Archangel. But his face
Deep scars of thunder had intrenched, and care
Sat on his faded cheek, but under brows
Of dauntless courage, and considerate pride,
Waiting revenge.

He now prepared
To speak; whereat their doubled ranks they
bend

From wing to wing, and half enclose him round
With all his peers. Attention held them mute.
Thrice he essayed, and thrice, in spite of scorn,
Tears, such as Angels weep, burst forth; at last
Words interwove with sighs found out their way:
"O myriads of immortal Spirits! O Powers,
Matchless, but with the Almighty!—and that
strife

Was not inglorious, though the event was dire,
As this place testifies, and this dire change,
Hateful to utter. But what power of mind,
Foreseeing or presaging, from the depth
Of knowledge past or present, could have feared
How such united force of gods, how such
As stood like these, could ever know repulse?

He who reigns
Monarch in Heaven till then as one secure
Sat on His throne, upheld by old repute,
Consent, or custom, and His regal state
Put forth at full, but still His strength concealed;
Which tempted our attempt, and wrought our fall.
Henceforth His might we know, and know our
own,

So as not either to provoke, or dread
New war provoked. Our better part remains
To work in close design, by fraud or guile,
What force effected not; that he no less
At length from us may find who overcomes
By force hath overcome but half his foe.
Space may produce new Worlds, whereof so rife
There went a fame in Heaven that He ere long
Intended to create, and therein plant
A generation whom His choice regard
Should favour equal to the Sons of Heaven.
Thither, if but to pry, shall be perhaps
Our first eruption—thither, or elsewhere:
For this infernal pit shall never hold
Celestial Spirits in bondage, nor the abyss
Long under darkness cover. But these thoughts

Full counsel must mature. Peace is despaired;
For who can think submission? War, then, war
Open or understood, must be resolved."

He spake; and to confirm his words, out-flew
Millions of flaming swords, drawn from the thighs
Of mighty Cherubim. The sudden blaze
Far round illumined Hell. Highly they raged
Against the Highest, and fierce with grasped arms
Clashed on their sounding shields the din of war,
Hurling defiance toward the vault of Heaven.

The exiled host now, led by Mammon,
"the least erected spirit that fell from
Heaven," proceeded to build Pandemonium, their architect being him
whom "men called Mulciber," and here
The great seraphic Lords and Cherubim
In close recess and secret conclave sat,
A thousand demi-gods on golden seats.

THE FIEND'S CONCLAVE

HIGH on a throne of royal state, which far
Outshone the wealth of Ormus or of Ind,
Or where the gorgeous East with richest hand
Showers on her kings barbaric pearl and gold
Satan exalted sat, by merit raised
To that bad eminence.

Here his compeers gathered round to
advise. First, Moloch, the "strongest
and the fiercest spirit that fought in
Heaven," counselled war. Then uprose
Belial, "a fairer person lost not Heaven,"
and reasoned that force was futile.

The towers of Heaven are filled
With armed watch, that render all access
Impregnable.

Besides, failure might lead to their
annihilation, and who wished for that?

Who would lose,
Though full of pain, this intellectual being,
These thoughts that wander through eternity?

They were better now than when they
were hurled from Heaven, or when
they lay chained on the burning lake.
Their Supreme Foe might in time remit
His anger, and slacken those raging
fires. Mammon also advised them to
keep the peace, and make the best
they could of Hell, a policy received
with applause; but then Beelzebub,
"than whom, Satan except, none
higher sat," rose, and with a look which
"drew audience and attention still as
night," developed the suggestion pre-
viously made by Satan, that they should
attack Heaven's High Arbitrator through
His new-created Man, waste His creation,
and "drive as we are driven."

This would surpass
Common revenge, and interrupt His joy
In our confusion, and our joy upraise
In His disturbance.

MILTON'S MASTERPIECE

This proposal was gleefully received. But then the difficulty arose who should be sent in search of this new world? All sat mute, till Satan declared that he would seek "abroad through all the coasts of dark destruction," a decision hailed with reverent applause. The council dissolved, the Infernal Peers disperse to their several employments; some to sports, some to warlike feats, some to argument, "in wandering mazes lost," some to adventurous discovery; while Satan wings his way to the nine-fold gate of Hell, guarded by Sin and her abortive offspring Death; and Sin, opening the gate for him to go out, cannot shut it again. The Fiend stands on the brink, "pondering his voyage," while before him appear

The secrets of the hoary Deep—a dark
Illimitable ocean, without bound,
Without dimension; where length, breadth, and
height,
And time, and place, are lost; where eldest Night
And Chaos, ancestors of Nature, hold
Eternal anarchy.

At last he spreads his "sail-broad vans for flight," and, directed by Chaos and sable-vested Night, comes to where he can see far off

The empyreal Heaven, once his native seat
And, fast by, hanging in a golden chain,
This pendent World.

SATAN SPEEDS TO EARTH

AN invocation to Light, and a lament for the poet's blindness now preludes a picture of Heaven, and the Almighty Father conferring with the only Son.

Hail, holy Light, offspring of Heaven first-born!
Bright effluence of bright essence increate!
Whose fountain who shall tell? Before the Sun,
Before the Heavens, thou wert, and at the voice
Of God, as with a mantle, didst invest
The rising World of waters dark and deep,
Won from the void and formless Infinite!

But thou
Revisit'st not these eyes, that roll in vain
To find thy piercing ray, and find no dawn.

With the year
Seasons return; but not to me returns
Day, or the sweet approach of even or morn,
Or sight of vernal bloom, or summer's rose,
Or flocks, or herds, or human face divine;
But cloud instead, and ever-during dark
Surrounds me, from the cheerful ways of men
Cut off.

God, observing the approach of Satan to the world, foretells the fall of man to the Son, Who listens while

In His face
Divine compassion visibly appeared,
Love without end, and without measure grace.

The Father asks where such love can be found as will redeem man by satisfying eternal Justice.

He asked, but all the Heavenly Quire stood mute,
And silence was in Heaven.

Admiration seized all Heaven, and "to the ground they cast their crowns in solemn adoration," when the Son replied:

Account Me Man. I for his sake will leave
Thy bosom, and this glory next to Thee
Freely put off, and for him lastly die
Well pleased; on Me let Death wreck all his rage.
Under his gloomy power I shall not long
Lie vanquished.

While the immortal quires chanted their praise, Satan drew near and sighted the World—the Sun, Earth, Moon, and companion planets.

As when a scout,
Through dark and desert ways with peril gone
All night, at last by break of cheerful dawn
Obtains the brow of some high-climbing hill,
Which to his eye discovers unaware
The goodly prospect of some foreign land
First seen, or some renowned metropolis
With glistening spires and pinnacles adorned,
Which now the rising Sun gilds with his beams,
Such wonder seized, though after Heaven seen,
The Spirit malign, but much more envy seized,
At sight of all this world beheld so fair.

Flying to the Sun, and taking the form of "a stripling Cherub," Satan recognises there the Archangel Uriel and accosts him.

Brightest Seraph, tell
In which of all these shining orbs hath Man
His fixed seat?

And Uriel, although held to be "the sharpest-sighted spirit of all in Heaven," was deceived, for angels cannot discern hypocrisy. So Uriel, pointing, answers:

"That place is Earth, the seat of Man . . .
That spot to which I point is Paradise,
Adam's abode; those lofty shades his bower.
Thy way thou canst not miss; me mine requires."
Thus said, he turned; and Satan, bowing low,
As to superior spirits is wont in Heaven,
Where honour due and reverence none neglects,
Took leave, and toward the coast of Earth
beneath,

Down from the ecliptic, sped with hoped success,
Throws his steep flight in many an aery wheel,
Nor stayed till on Niphates' top he lights.

OF ADAM AND EVE IN PARADISE

COMING within sight of Paradise, Satan's conscience is aroused, and he grieves over the suffering his dire work will entail, exclaiming:

Me miserable! Which way shall I fly
Infinite wrath and infinite despair?
Which way I fly is Hell; myself am Hell.

But he cannot brook submission, and hardens his heart afresh.

So farewell hope, and, with hope, farewell fear,
Farewell remorse! All good to me is lost;
Evil, be thou my Good.

As he approaches Paradise more closely the deliciousness of the place affects even his senses.

As when to them who sail
Beyond the Cape of Hope, and now are past
Mozambic, off at sea north-east winds blow
Sabean odours from the spicy shore
Of Araby the Blest, with such delay
Well pleased they slack their course, and many
a league

Cheered with the grateful smell old Ocean smiles,
So entertained those odorous sweets the Fiend.

At last, after sighting "all kinds of living creatures new to sight and strange," he descries Man.

Two of far nobler shape, erect and tall,
God-like erect, with native honour clad
In naked majesty, seemed lords of all,
And worthy seemed; for in their looks divine
The image of their glorious Maker shone.

For contemplation he, and valour, formed,
For softness she and sweet attractive grace;
He for God only, she for God in him.

So hand in hand they passed, the loveliest pair
That ever since in love's embraces met:
Adam the goodliest man of men since born
His sons; the fairest of her daughters Eve.

At the sight of the gentle pair, Satan again almost relents. Taking the shape of various animals, he approaches to hear them talk, and finds from Adam that the only prohibition laid on them is partaking of the Tree of Knowledge. Eve, replying, tells how she found herself alive, saw her form reflected in the water, and thought herself fairer even than Adam until

Thy gentle hand
Seized mine; I yielded, and from that time see
How beauty is excelled by manly grace
And wisdom, which alone is truly fair.

While Satan roams through Paradise, with "sly circumspection," Uriel descends on an evening sunbeam to warn Gabriel, "chief of the angelic guards," that a suspected spirit, with looks "alien from Heaven," had passed to Earth, and Gabriel promises to find him before dawn.

Now came still Evening on, and Twilight grey
Had in her sober livery all things clad;
Silence accompanied; for beast and bird,
They to their grassy couch, these to their nests
Were slunk, all but the wakeful nightingale;
She all night long her amorous descant sung;
Silence was pleased. Now glowed the firmament
With living sapphires; Hesperus, that led

The starry host, rode brightest, till the Moon,
Rising in clouded majesty, at length
Apparent queen, unveiled her peerless light,
And o'er the dark her silver mantle threw.

Adam and Eve talk ere they retire to rest—she questioning him.

Sweet is the breath of Morn, her rising sweet
With charm of earliest birds; pleasant the Sun,
When first on this delightful land he spreads
His orient beams on herb, tree, fruit, and flower,
Glistening with dew; fragrant the fertile Earth
After soft showers; and sweet the coming on
Of grateful Evening mild; then silent Night,
With this her solemn bird, and this fair Moon,
And these the gems of Heaven, her starry train;
But neither breath of Morn, when she ascends
With charm of earliest birds; nor rising Sun
On this delightful land; nor herb, fruit, flower,
Glistening with dew; nor fragrance after showers;
Nor grateful Evening mild; nor silent Night,
With this her solemn bird; nor walk by moon,
Or glittering star-light, without thee is sweet.
But wherefore all night long shine these? For
whom

This glorious sight, when sleep hath shut all
eyes?

Adam replies:

These have their course to finish round the Earth,

These then, though unbeheld in deep of night,
Shine not in vain. Nor think, though men were
none,
That Heaven would want spectators, God want
praise.

Millions of spiritual creatures walk the Earth
Unseen, both when we wake and when we sleep;
All these with ceaseless praise His works behold
Both day and night.
Thus talking, hand in hand, alone they passed
On to their blissful bower.

Gabriel then sends the Cherubim
"armed to their night watches," and commands Ithuriel and Zephon to search the Garden, where they find Satan, "squat like a toad close at the ear of Eve," seeking to taint her dreams.

Him thus intent Ithuriel with his spear
Touched lightly; for no falsehood can endure
Touch of celestial temper, but returns
Of force to its own likeness.

Satan therefore starts up in his own person, and is conducted to Gabriel, who sees him coming with them, "a third, of regal port, but faded splendour wan." Gabriel and he engage in a heated altercation, and a fight seems imminent between the Fiend and the angelic squadrons that "begin to hem him round," when, by a sign in the sky, Satan is reminded of his powerlessness in open fight, and flees, murmuring; "and with him fled the shades of Night."

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THE MORNING HYMN OF PRAISE

ADAM, waking in the morning, finds Eve flushed and distraught, and she tells him of her troublous dreams. He cheers her, and they pass out to the open field, and, adoring, raise their morning hymn of praise to the Creator.

These are Thy glorious works, Parent of good,
Almighty ! Thine this universal frame,
Thus wondrous fair—Thyself how wondrous then!
Unspeakable ! Who sittest above these heavens
To us invisible, or dimly seen

In these Thy lowest works ; yet these declare
Thy goodness beyond thought, and power divine.
Speak, ye who best can tell, ye Sons of Light,
Angels—for ye behold Him, and with songs
And choral symphonies, day without night,
Circle His throne rejoicing—ye in Heaven ;
On Earth join, all ye creatures, to extol
Him first, Him last, Him midst, and without end.
Fairest of Stars, last in the train of Night,
If better thou belong not to the Dawn,
Sure pledge of Day, that crown'st the smiling
morn

With thy bright circlet, praise Him in thy sphere
While day arises, that sweet hour of prime.
Thou Sun, of this great World both eye and soul,
Acknowledge Him thy greater ; sound His praise
In thy eternal course, both when thou climb'st
And when high noon hast gained, and when thou
fall'st.

Moon, that now meet'st the orient Sun, now
fliest,
With the fixed Stars, fixed in their orb that flies ;
And ye five other wandering Fires, that move
In mystic dance, not without song, resound
His praise Who out of Darkness called up Light.

Ye Mists and Exhalations, that now rise
From hill or steaming lake, dusky or grey,
Till the Sun paint your fleecy skirts with gold,
In honour to the World's great Author rise ;
Whether to deck with clouds the uncoloured sky,
Or wet the thirsty earth with falling showers,
Rising or falling, still advance his praise.
His praise, ye Winds, that from four quarters
blow,

Breathe soft or loud ; and wave your tops, ye
pines,

With every plant in sign of worship wave.
Fountains, and ye that warble as ye flow,
Melodious murmurs, warbling, tune His praise.
Join voices, all ye living souls. Ye Birds,
That, singing, up to Heaven gate ascend,
Bear on your wings and in your notes His praise.

Hail, universal Lord ! Be bounteous still
To give us only good ; and, if the night
Have gathered aught of evil, or concealed,
Disperse it, as now light dispels the dark.

So prayed they innocent, and to their thoughts
Firm peace recovered soon, and wonted calm.

The Almighty now sends Raphael, " the sociable spirit," from Heaven to warn Adam of his danger, and alighting on the

eastern cliff of Paradise, the Seraph shakes his plumes and diffuses heavenly fragrance around ; then, moving through the forest is seen by Adam, who, with Eve, entertains him, and seizes the occasion to ask him of " their being, who dwell in Heaven," and further, what is meant by the angelic caution—" If ye be found obedient." Raphael thereupon tells of the disobedience, in Heaven, of Satan, and his fall, " from that high state of bliss into what woe." He tells how the Divine decree of obedience to the Only Son was received by Satan with envy, because he felt " himself impaired " ; and how, consulting with Beelzebub, he drew away all the spirits under their command to the " spacious North," and taunting them with being eclipsed, proposed that they should rebel. Only Abdiel remained faithful, and urged them to cease their " impious rage," and seek pardon in time, or they might find that He Who had created them could uncreate them.

So spake the Seraph Abdiel, faithful found ;
Among the faithless faithful only he ;
Among innumerable false unmoved,
Unshaken, unseduced, unterrified,
His loyalty he kept, his love, his zeal ;
Nor number nor example with him wrought
To swerve from truth, or change his constant
mind
Though single.

THE STORY OF SATAN'S REVOLT

RAPHAEL, continuing, tells Adam how Abdiel flew back to Heaven with the story of the revolt, but found it was known. The Sovran Voice having welcomed the faithful messenger with " Servant of God, well done ! " orders the Archangels Michael and Gabriel to lead forth the celestial armies, while the banded powers of Satan are hastening on to set the Proud Aspirer on the very Mount of God.

" Long time in even scale the battle hung," but with the dawning of the third day, the Father directed the Messiah to ascend His chariot, and end the strife. " Far off His coming shone," and at His presence " Heaven His wonted face renewed, and with fresh flowerets hill and valley smiled." But, nearing the foe, his countenance changed into a terror " too severe to be beheld." •

Full soon

Among them He arrived, in His right hand
Grasping ten thousand thunders
They, astonished, all resistance lost,
All courage ; down their idle weapons dropt.

..... Headlong themselves they threw
Down from the verge of Heaven; eternal wrath
Burnt after them to the bottomless pit.

A like fate, Raphael warns Adam, may befall mankind if they are guilty of disobedience.

THE NEW CREATION

THE "affable Archangel," at Adam's request, continues his talk by telling how the world began. Lest Lucifer should take a pride in having "dispeopled Heaven," God announces to the Son that He will create another world, and a race to dwell in it who may

Open to themselves at length the way
Up hither, under long obedience tried,
And Earth He changed to Heaven, and Heaven
to Earth.

This creation is to be the work of the Son, Who, girt with omnipotence, prepares to go forth.

Heaven opened wide
Her ever-during gates, harmonious sound
On golden hinges moving, to let forth
The King of Glory, in His powerful Word
And Spirit coming to create new worlds.
On Heavenly ground they stood, and from the shore

They viewed the vast immeasurable abyss,
Outrageous as a sea, dark, wasteful, wild,
Up from the bottom turned by furious winds
And surging waves, as mountains to assault
Heaven's highth, and with the centre mix the pole.

"Silence, ye troubled waves, and thou Deep,
peace!"

Said then the omnific Word. "Your discord
end!"

Nor stayed; but on the wings of cherubim,
Uplifted in paternal glory rode
Far into Chaos and the World unborn;
For Chaos heard his voice. . . .
And Earth, self-balanced on her centre hung.

The six days' creative work is then described in the order of Genesis.

Asked by Adam to tell him about the motions of the heavenly bodies, Raphael adjures him to refrain from thought on "matters hid; to serve God and fear and to be lowly wise." He then asks Adam to tell him of his creation, he having at the time been absent on "excursion toward the gates of Hell." Adam complies, and relates how he appealed to God for a companion, and was answered in the fairest of God's gifts. Raphael warns Adam to beware lest passion for Eve sway his judgment, for on him depends the weal or woe, not only of himself, but of all his sons.

THE TEMPTATION AND THE FALL

WHILE Raphael was in Paradise, for seven nights Satan hid himself by circling round in the shadow of the Earth, then, rising as a mist, he crept into Eden undetected, and entered the serpent as the "fittest imp of fraud," but not until he had once more lamented that the enjoyment of the Earth was not for him.

In the morning, when the human pair came forth to their pleasant labours, Eve suggested that they should work apart, for when near each other "looks intervene and smiles," and casual discourse. Adam replied, defending "this sweet intercourse of looks and smiles," because they had been made not for irksome toil, but for delight.

But if much converse perhaps
Thee satiate, to short absence I could yield;
For solitude sometimes is best society,
And short retirement urges sweet return.
But other doubt possesses me, lest harm
Befall thee.

The wife, where danger or dishonour lurks,
Safest and seemliest by her husband stays,
Who guards her, or with her the worst endures.

Eve, "with sweet austere composure," replies in turn:

That such an enemy we have, who seeks
Our ruin, both by thee informed I learn,
And from the parting Angel overheard,
As in a shady nook I stood behind,
Just then returned at shut of evening flowers.

She, however, repels the suggestion that she can be deceived. Adam replies that united they would be stronger and more watchful. Eve responds that if Eden is so exposed that they are not secure apart, how can they be happy? Adam gives way, and she leaves him.

Seeing her, Satan, "much the place
admired, the person more."

As one who, long in populous city pent,
Forth issuing on a summer's morn to breathe
Among the pleasant villages and farms
Adjoined, from each thing met conceives delight.
Such pleasure took the Serpent to behold
This flowery plat, the sweet recess of Eve
Thus early, thus alone.

The original serpent did not creep on the ground, but was a handsome creature
With burnished neck of verdant gold, erect
Amidst his circling spires, that on the grass
Floated redundant. Pleasing was his shape
And lovely.

Appearing before Eve with an air of worshipful admiration, and speaking in human language, the arch-deceiver gains her ear with flattery. "Empress of this fair world, resplendent Eve." She asks how it is that man's language is pronounced by "tongue of brute." The

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reply is that the power came through eating the fruit of a certain tree, which gave him reason, and also constrained him to worship her as "soveran of creatures." Asked to show her the tree, he leads her swiftly to the Tree of Prohibition, and replying to her scruples and fears, declares :

"Queen of this Universe ! Do not believe Those rigid threats of death. Ye shall not die. How should ye ? By the fruit ? It gives you life To knowledge. By the Threatener ? Look on me, Me who have touched and tasted, yet both live And life more perfect have attained than Fate Meant me, by venturing higher than my lot. Shall that be shut to Man which to the Beast Is open ? Or will God incense His ire For such a petty trespass ? . . .

God therefore cannot hurt ye and be just. . . . Goddess humane, reach, then, and freely taste ! " He ended ; and his words, replete with guile, Into her heart too easy entrance won.

Eve herself then took up the argument and repeated admiringly the Serpent's persuasions.

"In the day we eat Of this fair fruit our doom is we shall die ! How dies the Serpent ? He hath eaten and lives, And knows, and speaks, and reasons, and discerns, Irrational till then. For us alone Was death invented ? Or to us denied This intellectual food, for beasts reserved ?

Here grows the cure of all, this fruit divine, Fair to the eye, inviting to the taste, Of virtue to make wise. What hinders then To reach and feed at once both body and mind ? "

So saying, her rash hand in evil hour Forth-reaching to the fruit, she plucked, she eat. Earth felt the wound, and Nature from her seat, Sighing through all her works, gave signs of woe That all was lost. Back to the thicket slunk The guilty Serpent.

At first elated by the fruit, Eve presently began to reflect, excuse herself, and wonder what the effect would be on Adam.

"And I perhaps am secret. Heaven is high, High, and remote to see from thence distinct Each thing on Earth ; and other care perhaps May have diverted from continual watch Our great Forbidder, safe with all His spies About Him. But to Adam in what sort Shall I appear ? Shall I to him make known As yet my change ? . . .

But what if God have seen. And death ensue ? Then I shall be no more ; And Adam, wedded to another Eve, Shall live with her enjoying, I extinct ! A death to think ! Confirmed then, I resolve Adam shall share with me in bliss or woe, So dear I love him that with him all deaths I could endure, without him live no life."

Adam the while Waiting desirous her return, had wove

Of choicest flowers a garland, to adorn Her tresses. . . . Soon as he heard The fatal trespass done by Eve, amazed From his slack hand the garland wreathed for her Down dropt, and all the faded roses shed. Speechless he stood and pale, till thus at length, First to himself, he inward silence broke :

"O fairest of creation, last and best Of all God's works, creature in whom excelled Whatever can to sight or thought be formed, Holy, divine, good, amiable, or sweet, How art thou lost ! How on a sudden lost !

Some cursed fraud Of enemy hath beguiled thee, yet unknown, And me with thee hath ruined ; for with thee Certain my resolution is to die. How can I live without thee ? How forego Thy sweet converse, and love so dearly joined, To live again in these wild woods forlorn ? "

Then, turning to Eve, he tried to comfort her.

"Perhaps thou shalt not die . . . Nor can I think that God, Creator wise, Though threatening, will in earnest so destroy Us, His prime creatures, dignified so high, Set over all His works. . . . However, I with thee have fixed my lot, Certain to undergo like doom. If death Consort with thee, death is to me as life.

Our state cannot be severed ; we are one."

So Adam ; and thus Eve to him replied : "O glorious trial of exceeding love, Illustrious evidence, example high ! " So saying she embraced him, and for joy Tenderly wept, much won that he his love Had so ennobled as of choice to incur Divine displeasure for her sake, or death. In recompense . . . She gave him of that fair enticing fruit With liberal hand. He scrupled not to eat Against his better knowledge, not deceived But fondly overcome with female charm.

The effect of the fruit on them is first to excite lust, with guilty shame following, and realising this after "the exhilarating vapour bland" had spent its force, Adam found utterance for his remorse.

O Eve, in evil hour thou didst give ear To that false Worm. . . .

How shall I behold the face Henceforth of God or Angel, erst with joy And rapture so oft beheld ? Those Heavenly shapes

Will dazzle now this earthly with their blaze Insufferably bright. Oh, might I here In solitude live savage, in some glade Obscured, where highest woods, impenetrable To star or sunlight, spread their umbrage broad, And brown as evening ! Cover me, ye pines ! Ye cedars, with innumerable boughs Hide me, where I may never see them more !

Then they cower in the woods, and clothe themselves with leaves.

LITERATURE

Covered, but not at rest or ease of mind
They sat them down to weep.

But passion also took possession of them,
and they began to taunt each other with
recriminations. Adam, with estranged
look, exclaimed :

Would thou hadst hearkened to my words,
and stayed
With me, as I besought thee, when that strange
Desire of wandering, this unhappy morn,
I know not whence possessed thee! We had then
Remained still happy!

Eve retorts :

Hadst thou been firm and fixed in thy dissent
Neither had I transgressed nor thou with me.

Then Adam :

What could I more?
I warned thee, I admonished thee, foretold
The danger, and the lurking enemy
That lay in wait; beyond this had been force.

Thus they in mutual accusation spent
The fruitless hours, but neither self-condemning;
And of their vain contest appeared no end.

SIN AND DEATH TRIUMPH

THE Angels left on guard now slowly
return from Paradise to Heaven to re-
port their failure, but are reminded by
God that it was ordained; and the Son
is sent down to judge the guilty pair,
after hearing their excuses, and to punish
them with the curses of toil and death.
Meantime Sin and Death "snuff the
smell of mortal change" on Earth, and
leaving Hell-gate "belching outrageous
flame," erect a broad road from Hell to
Earth through Chaos, and as they come
in sight of the World meet Satan steering
his way back as an angel, "between the
Centaur and the Scorpion." He makes
Sin and Death his plenipotentiaries on
Earth, adjuring them first to make Man
their thrall, and lastly kill; and as they
pass to the evil work "the blasted stars
look wan." The return to Hell is received
with loud acclaim, which comes in the
form of a hiss, and Satan and all his hosts
are turned into grovelling snakes. Adam,
now in his repentance, is sternly resentful
against Eve, who becomes submissive, and
both pass from remorse to "sorrow un-
feigned and humiliation meek."

REPENTANCE AND DOOM

THE repentance of the pair is accepted
by God, Who sends down the Arch-
angel Michael, with a cohort of cherubim
to announce that death will not come until

time has been given for repentance, but
Paradise can no longer be their home.
Whereupon Eve laments :

O unexpected stroke, worse than of Death!
Must I thus leave thee, Paradise? Thus leave
Thee, native soil? These happy walks and shades,
Fit haunt of gods, where I had hoped to spend
Quiet, though sad, the respite of that day
That must be mortal to us both? O flowers,
That never will in other climate grow,
My early visitation and my last
At even, which I bred up with tender hand
From the first opening bud and gave ye names,
Who now shall rear ye to the Sun, or rank
Your tribes, and water from the ambrosial
fount?

How shall we breathe in other air
Less pure, accustomed to immortal fruits?

The Angel reminds her :

Thy going is not lonely; with thee goes
Thy husband; him to follow thou art bound;
Where he abides think there thy native soil.

Michael then ascending a hill with Adam
shows him a vision of the world's history,
while Eve sleeps.

PARADISE BEHIND, THE WORLD BEFORE

THE history is continued, with its pro-
mise of redemption, until Adam ex-
claims :

Full of doubt I stand
Whether I should repent me now of sin.
By me done and occasioned, or rejoice
Much more that much more good thereof shall
spring—
To God more glory, more goodwill to men.

Eve awakens from propitious dreams,
it having been shown to her that

Though all by me is lost
Such favour I unworthy am vouchsafed.
By me the Promised Seed shall all restore.

The time, however, has come when they
must leave. A flaming sword, "fierce as
a comet," advances towards them before
the bright array of cherubim.

Whereat
In either hand the hastening angel caught
Our lingering parents, and to the eastern gate
Led them direct, and down the cliff as fast
To the subjected plain—then disappeared.
They, looking back, all the eastern side beheld
Of Paradise, so late their happy seat,
Waved over by that flaming brand, the gate
With dreadful faces thronged and fiery arms.
Some natural tears they dropped, but wiped
them soon;

The world was all before them, where to choose
Their place of rest, and Providence their guide.
They, hand in hand, with wandering steps and
slow,
Through Eden took their solitary way.

The Story of the Most Beautiful Book in the World

Paul's Farewell to His Friends

NOW behold, I go bound in the spirit unto Jerusalem, not knowing the things that shall befall me there, save that the Holy Spirit witnesseth in every city, saying that bonds of afflictions abide me.

But none of these things move me, neither count I my life dear unto myself, so that I might finish my course with joy, and testify the gospel of the grace of God. Now, behold, I know that ye all, among whom I have gone preaching the kingdom of God, shall see my face no more.

And now, brethren, I commend you to God. I have coveted no man's silver, or gold, or apparel. Ye yourselves know that these hands have ministered unto my necessities, and to them that were with me. I have showed you all things, how that so labouring ye ought to support the weak, and to remember the words of the Lord Jesus, how he said, It is more blessed to give than to receive.

When he had thus spoken he kneeled down, and prayed with them all; and they all wept sore, and fell on Paul's neck, and kissed him, sorrowing most of all for the words he spake that they should see his face no more. *From Paul's Speeches*

THE LAST DAYS OF PAUL

WE must not forget that Paul was a man of action as well as a man of learning. He is, indeed, the greatest of missionaries, and suffered all the privations and penalties of those who set out to teach the world new truth.

Thrice was I beaten with rods (he says); once was I stoned, thrice I suffered shipwreck, a night and a day I have been in the deep; in journeyings often, in perils of waters, in perils of robbers, in perils by mine own countrymen, in perils by the heathen, in perils in the city, in perils in the wilderness, in perils in the sea, in perils among false brethren; in weariness and painfulness, in watchings often, in hunger and thirst, in fastings often, in cold and nakedness.

We accept the religion of Jesus today as a part of life. It seems to us as natural as trees and houses. We cannot think of a civilised town without a church. We cannot imagine a Sunday without the ringing of church bells and the singing of hymns.

But once there was no religion of Jesus. Once the idea that love is far more powerful than strength, and forgiveness more beautiful than revenge, would have been laughed to scorn by all mankind. Once the revelation that God is our Father in heaven, and that all men are brothers, would have been deemed incredible. And to teach men these new truths

required courage of the highest kind, because these sublime ideas attacked and destroyed by their very beauty the proud priesthoods of false religions. Christianity was a revolution. It altered the whole idea of life which had prevailed in the world for centuries.

Paul is the great revolutionist of history. We talk about the French Revolution, but all that period of storm and horror accomplished nothing in comparison with the work of this one man. It was Paul who flung the thoughts of the whole civilised world into a new channel. Let us think what a work it was to bring Greeks and Romans to the adoration of a crucified Jew, to convince them that Jesus of Nazareth, crucified between two thieves, was Jesus the Son of God. This was the work of Paul, and it is matchless in the history of human achievement.

Among all the incidents in Paul's tempestuous life, few have so great a fascination for us as that journey to Rome, on which he endured all the horrors of a typhoon, and suffered the terrors and excitements of shipwreck. Nowadays our missionaries make perilous journeys in order to preach the religion of Jesus to heathen nations, but Paul's great journey stands out in history for all time,

GREAT FIGURES OF THE OLD TESTAMENT · THE LIFE OF JESUS

unique for what it accomplished, and unequalled in its narrative for picturesque simplicity and compelling truth.

Paul, who was a prisoner, and had appealed to Caesar, was with other prisoners shipped on board a small trading vessel and, under the care of a centurion, set out for Rome. His great ambition to reach the metropolis of the world was at last to be fulfilled; but he was destined to journey there under Roman soldiers, a prisoner in chains.

The season of the year was getting late for sailing, but the long journey began prosperously enough, although Paul, who had been a prisoner for two years, appears to have suffered. We can imagine that a man of Paul's fiery and exalted nature would feel the rigours of a sea voyage in a miserable trading vessel at the very worst season of the year.

C HAINED TO ROMAN SOLDIERS IN A STORM-TOSSED SHIP AT SEA

After leaving Sidon the heavens frowned upon the little ship, and for two months the wretched prisoners, each man chained to a Roman soldier, endured the terrors of tempest. A contrary wind obliged the sailors to forsake their course, and after no little difficulty they dropped anchor in a river near by the town of Myra. Here the prisoners were passed into a large vessel from Alexandria, laden with corn. A contrary wind still blew hard, but the Alexandrian vessel crept along the shore, and came at last to a place known as Fair Havens.

It was now getting towards the end of September, when the Jews regarded the sea as closed to navigation, and some time was spent in considering what should be done. Would it be well to winter in Fair Havens, or to try to round Cape Matala to Port Phoenix, which was a much better port, and a far pleasanter town for winter quarters?

Paul ventured to join in the discussion. "Sirs," said he, "I perceive that this voyage will be with hurt and much damage, not only of the lading and ship, but also of our lives." They knew he was a great traveller, and well acquainted with that sea, but his advice to winter in Fair Havens was disregarded, and the vessel put to sea once more.

At first everything prospered, and, towing the ship's boat behind them, they made a pleasant run through the waters. But

suddenly a storm, as furious as the typhoon, that terrific hurricane which is the terror of all sailors, swept down upon them.

What could these poor sailors do in a vessel which had but one mainmast and one mainsail? They were powerless even to furl the sail, and could do nothing but let the ship rush on and drive before the tempest.

A FRAIL VESSEL AT THE MERCY OF THE GREAT STORM

Later on an attempt was made to get the ship's boat on board, in case it should be necessary to escape from the ship. Luke, who was on the ship, and who wrote the account of the voyage, helped to pull the boat on board, a most difficult task, and we can imagine how the boat must have looked as it came in from the swirling waters at the stern of the ship, its timbers sore beaten and half buried under the sea.

Then the sailors under-girded the vessel, by passing thick ropes under the prow and fastening them tightly together around the middle. But there was no port to which they could run, and nothing remained for these storm-harried mariners except the heart-breaking task of what is called lying-to. So, with the longboat on board, the vessel tied up with cords, the sails were set so that the wind steadied the ship and held it in one place, rolling, pitching, tossing, and straining all its timbers, helpless in the midst of the tempest.

THE TERRIBLE SUFFERINGS OF THE MEN ON THE SINKING SHIP

Luke's narrative tells how the ship rolled exceedingly, and how, the next day the sailors lightened the ship, while on the third day he and other prisoners helped to cast at the tackling of the ship: that is to say, they threw overboard the great main-yard. The cargo must have been shifting all this time with the violence of the sea, and it can be imagined how great must have been the danger of heeling over, owing to the weight.

A gloomy apathy (says Dean Farrar) began to settle more and more upon those helpless three hundred souls. There were no means of cooking, no fire could be lighted; the caboose and utensils must long ago have been washed overboard; the provisions had probably been spoiled and sodden by the waves that broke over the ship; indeed, with death staring them in the face, no one cared to eat. They were famishing wretches in a fast-sinking ship, drifting, with hopes that diminished day by day, to what they regarded as an awful and a certain death.

THE LAST DAYS OF PAUL

But Paul was calm in the midst of the storm, and faithful in the face of danger. Hestood up, and said to the wretched crews:

Sirs, ye should have hearkened unto me, and not have loosed from Crete, and to have gained this harm and loss. And now I exhort you to be of good cheer, and there shall be no loss of any man's life among you, but of the ship. For there stood by me this night the angel of God, whose I am, and whom I serve, saying, Fear not, Paul; thou must be brought before Caesar; and lo, God hath given thee all them that sail with thee. Wherefore, sirs, be of good cheer, for I believe God, that it shall be even as it was told me.

THE VISION IN THE NIGHT THAT GAVE HOPE TO THE TRAVELLERS

The sailors took heart from these words, and some time later, hearing the roar of breakers, they sounded, and found themselves in twenty fathoms of water. Again they sounded; only fifteen fathoms! Yes, land was near, but their danger was enormous. The roaring wind blew hard, it might hurl them on to a reef. Anchors were cast out, and stuck fast in the clay. Still the danger was terrible. The roar of the breakers grew louder and louder. What would be the vessel's fate?

The sailors made an attempt to escape by the boat, but Paul prevented it; and, begging all those on board to eat and strengthen themselves, he himself took bread, gave thanks to God, and ate. Thus hope returned to the panic-stricken crew, and with their new strength they flung out the cargo into the sea, lightening the ship. When morning dawned they saw the land, an island washed by furious waters.

The vessel drove ashore till the prow stuck fast in the land, while the stern was battered to pieces by the waves. For a moment the soldiers wanted to kill the prisoners, fearing an escape; but the centurion in charge prevented this, and every man landed in safety.

HOW PAUL STEPPED ON TO WHAT IS NOW BRITISH SOIL

The shipwrecked men found that they had landed on the island of Melita, which is now Malta, and they were treated well. One little incident is recorded which makes us feel how absolutely true is the whole narrative. While Paul was making a fire of sticks, a viper, warmed by the flames, crawled out and fastened on his hand.

And when the barbarians saw the venomous beast hang on his hand, they said among them-

selves, No doubt this man is a murderer, whom, though he hath escaped the sea, yet vengeance suffereth not to live. And he shook off the beast into the fire, and felt no harm. Howbeit they looked when he should have swollen, or fallen down dead suddenly; but after they had looked a great while, and saw no harm come to him, they changed their minds, and said that he was a god.

It is an extraordinary picture from the life of this most extraordinary man.

Paul, a fettered prisoner, arrived in Rome, and the angels who keep the chronicles of the human race turned over another page and began a new chapter.

Jesus had lived his sublime and humble life in a little district of a despised country. He never saw the splendours of barbaric civilisation, the loveliness of Antioch, and the glory of Rome. Jerusalem, with its narrow streets, represented for him a great metropolis, a city of the world. He lived and died in a province of the Roman Empire, foreign and provincial.

THE WONDERFUL WORK THAT PAUL DID, A PRISONER IN A HIRED LODGING

But the inspiration of his life fell on Saul of Tarsus, and the feet of this great man were swift to carry far afield from Jerusalem and Galilee the glad tidings of great joy. Jesus is the Light of the World; Paul was the man who carried the Light into Europe.

For some years before his arrival in Rome Paul had been a prisoner awaiting trial, and for years after his arrival he remained a prisoner, chained to a Roman soldier, but in his own lodgings and receiving friends and strangers who were curious to see so remarkable a man.

It is one of the most striking facts of history that the immense work of Paul in Rome was accomplished in a hired lodging and as a fettered prisoner. There was nothing to startle men in this event that shook the pillars of the world.

We might imagine that Paul arrived in Rome with a shouting host around him, that he marched in victory through the seething streets, that he stood face to face with Nero, and, denouncing that monster of iniquity, held up before the Roman Eagle the Cross of Jesus. We might imagine that he delivered magnificent orations, calling the people to revolution.

But not in this way was the work of Christianising Europe accomplished.

Think how it began! It began with Paul's quiet talks to the soldier who guarded him, and to whom he was chained. For hour after hour to every fresh soldier who came to share his fetters, Paul told the story of Jesus, and discussed the ideas of kindness and love, of goodness and self-sacrifice, of a Father in heaven who cares for us and desires us to be happy. Every word he said was a seed destined to spread among a whole legion of the Roman army, in due time to bring forth a harvest in the farthest corners of the world.

THE GREATEST MISSIONARY THAT THE WORLD HAS KNOWN

This great missionary, by far the greatest the world has ever known, did his work at Rome by means of simple conversations. He talked to men and touched them with the spell of Jesus. He discussed the revelation of Jesus with visitors who came to see him, and not only sapped the foundations of the mightiest empire in existence, but changed the world's history. The new page in human history was begun by a chained prisoner, talking to his friends in a Roman lodging.

But there was one great moment in Paul's life at this time. He was brought to trial, and some think he stood face to face with Nero himself. If this is indeed true, never was there a more dramatic meeting of two human forces.

Paul, old and bowed, would stand before Nero, young and insolent; the old Paul standing for a new Earth, while the young Nero represented the death of the old. Paul had lived only for others. He was pure, tender, considerate; he loved righteousness; was full of a manful contempt for all meanness, vileness, and sin.

THE WONDERFUL MOMENT WHEN PAUL MAY HAVE BEEN FACE TO FACE WITH NERO

Nero, on the other hand, was a miserable wretch, longing for evil, destroying the lives of children, torturing men and women for his amusement. He was a tyrant and a murderer. It is impossible for men to read his history without being convinced that he was inhuman.

Therefore, if indeed it was before Nero that Paul stood, we have truly one of the most dramatic meetings in the world's history. We have man's desire for God face to face with man's desire for evil.

It is believed that Paul escaped with his life from that trial, but remained a prisoner, though his doom was certain. How it came we do not know. In the

immense confusion of the fall of the Roman Empire the death of Paul is lost as a little thing of no moment. It was only perceived long afterwards, in the resurrection of the world and in the birth of a new religion, that the poor, solitary, deserted, and fettered prisoner in his lodgings had filled a greater place in the history of the world than the emperor on his throne. Dean Farrar has imagined for us the closing scene:

They who will may follow him in imagination to the possible scene of his martyrdom, but every detail must be borrowed from the imagination alone. It may be that the legendary is also the real scene of his death. If so, accompanied by the centurion and the soldiers who were to see him executed, he left Rome by the gate now called by his name. For nearly three miles the sad procession walked, and doubtless the dregs of the populace, who always delight in a scene of horror, gathered round them.

About three miles from Rome, not far from the Ostian road, is a green and level spot, with low hills around it, known now as Tre Fontane. There the word of command to halt was given; the prisoner knelt down, the sword flashed, and the life of the greatest of the apostles was shorn away.

THE MAN WHO BROUGHT ABOUT THE GREATEST MIRACLE IN HISTORY

Here ends for us the life of a solitary man who occupies a place in history second only to the matchless glory of his Master. He was hated by the Jews; among the Christians of his own race he was distrusted; he was loved by but one man, the gracious and youthful Timothy; and he was weak and afflicted.

Nevertheless, it was Paul, who died an unknown death of martyrdom, whose life-story is the story of Christianity passing out from the East to conquer the world.

We who have now followed the story of Paul from the beginning have followed the narrative of the greatest miracle in history, for the miracle of all miracles is the triumph of Christianity after the Crucifixion. No man can explain how Christianity conquered the world except by acknowledging that Paul was changed by a miracle, and was supported by God through his life of preaching to the Gentiles. We look back in history, and we see no man who has done a greater work for the world than Paul, the matchless hero who interpreted his Master to all peoples and all generations.

The Interests and Pleasures of Life for All Indoors and Out



HOW TO TEACH A PARROT TO TALK

A PARROT is always an interesting pet to keep on account of its remarkable power of imitating human speech, but we must not suppose that a parrot ever talks intelligently, thinking about what it says, like a child. If its remarks or its questions and answers seem apt, this is merely a chance.

There are over four hundred different kinds of parrots, and almost every variety shows this gift of uttering words. The choice of any particular kind of parrot must, therefore, be left to individual taste, and if, when purchased, it does not speak, it can generally be trained to do so, provided it is not very old. It is important, however, that the bird bought should be healthy.

A large and suitable cage should be in readiness for it, and, water and food having been placed inside, the bird should be put into its new home. The best form of cage is square, with a vaulted top, and it must be kept perfectly clean. The perch, which should be of wood, must not be too smooth, and should not be covered with metal to prevent gnawing.

The bird cannot hold on to smooth metal properly, and uses up much strength in trying to do so. When a perch has been gnawed it can be renewed. There should be no swing in the cage, as it interferes with the comfort of the bird and lessens the space for wing-stretching.

It is most important to feed a parrot properly, and all mashy foods like boiled maize, soaked bread, and so on, are injurious. The larger parrots, which are those generally kept, need dry maize and oats with stale bread and dry ship's biscuits. To kill any parasites the maize should be scalded

with boiling water, then rubbed in a cloth, and finally put in a warm place to dry well. From time to time additions of fruit—apple, pear, grape, cherry—may be made, and walnuts or sweet almonds, but not bananas, dates, figs, or oranges; and in all cases it is most important to see that there is no taint about the food or the parrot will get ill.

Twigs and branches of trees like the willow, poplar, beech, birch, apple, pear, and cherry may be given for gnawing.

Medium-sized parrots should be given oats, hemp, canary seed, and millet, and small parrots the same diet with the omission of hemp.

All parrots need lime, which should be supplied in the form of cuttle-fish shell. If this cannot be obtained, calcined oyster shells may be substituted, or even chalk. Sand must be kept in the case, as it aids cleanliness. The water supplied to parrots should be first boiled.

It is assumed that a tame parrot will have been bought, as the taming and training of a wild parrot just brought from overseas is a very long, tedious, and difficult task, which would require more space to describe than we can give here.

Dr. Karl Russ, the great authority on parrots, thus describes the method of teaching the birds to talk, prefacing his remarks with the injunction that to be successful it is essential that the teacher establish a friendly footing with the bird and show a loving sympathy.

"Every morning on first going into the room where the parrot is, and every evening as well as several times during the day, one

THINGS TO MAKE & DO

word first, very distinctly pronounced, should be said to it clearly and sharply, and, if possible, all drawling, lisping, or other mispronunciation avoided. A full-toned word, with the vowel a or o, and also with a hard consonant, such as k, p, r or t, should be chosen, and hissing sounds avoided.

The parrot should be treated kindly, so that it will gain confidence, and everything said to it should awaken in its mind a distinct perception. For this, says Dr. Russ, it is necessary that it should have some conception of time and place. "Good-morning!" should be said early, and "Good-night!"

late; "How do you do?" on arrival, and "Good-bye!" when going away. One should knock and then call out "Come in!"

The bird should be praised and rewarded when it does well, and scolded when obstinate or sulky. An intelligent bird soon gets to understand what is required of it, and progress will then be more rapid. Progress should be made from easy words to more difficult ones, and only when one word or phrase is learned thoroughly should a new one be tried. In the early stages all that has already been learned should be repeated day by day.

HOW TO TAKE BRASS RUBBINGS

AN exceedingly interesting hobby for those who are able to travel about among the old churches of the English countryside is to make a collection of rubbings of ancient memorial brasses.

The materials required are not expensive, and the work necessary is not very skilled.

England is the great country of memorial brasses, there being about four thousand scattered up and down the land, but mostly in the eastern counties; whereas Wales has only about 20, Scotland three, Ireland five, and the whole of the Continent about 250.

The oldest known memorial brass to be set up was that of Simon de Beauchamp, Earl of Bedford, who died about 1208, and was placed in St. Paul's Church, Bedford; but this, unfortunately, no longer exists. The oldest existing brass is that of Sir John d'Aubernoun, dated 1277, at Stoke Dabernon, Surrey, the only example of a knight bearing a lance; while in Trumpington Church, near Cambridge, is a brass, dated 1289, to Sir Roger de Trumpington, the only brass memorial to a Crusader.

The materials required for taking brass rubbings are a soft cloth duster, nail-brush, a roll of white ceiling paper, which can be bought from a builder or decorator, a supply of black heel-ball (from a leather-merchant), a pencil, and a flannel rubber.

Having found a suitable brass let into the floor, we first of all dust the plate carefully and clean out the lines with the nail-brush. Then we unroll our paper over the brass, allowing at least a foot top and bottom, and hold it in position by placing heavy books, hassocks, or some other similar objects on the ends. It is important that the paper should be of a suitable substance, and only experience can teach what this is. If the paper is too thin it will tear during the rubbing, and if too thick it will be difficult to get a really satisfactory impression.

Our paper being in position on the brass, we first of all trace the outline with the pencil, so as to know the exact area over which we have to rub. Then we take a stick of heel-ball, which is a rather greasy black material, and rub till the impression is quite black, taking care all the time not to allow the paper to shift. Here again practice will make perfect, for there is a knack in taking a perfect rubbing which can only be learned in practice.

The work of taking a brass rubbing is not light. It becomes hard and tiring, and many a beginner gets into a bad habit of making poor impressions by giving up too soon. It is not enough merely to have a representation of the brass: we must rub and rub till this is quite black, except for the lines of the design and inscription which will then show up well. We finally polish the rubbing with the flannel while the paper is still in position. It is important for this purpose that the flannel should be clean.

The name of the person commemorated and that of the church where the brass is found, with the date the rubbing was made, should be written under the impression.

Rubbings may be kept rolled, or hung up, and they may be mounted on calico to give additional strength. The calico must be damped and stretched, the rubbing is then pasted on, and the whole left to dry while still stretched.

We should not take a rubbing of every brass we come across, and it is not wise at first to take very large rubbings. Begin on the smaller brasses, and obtain the permission of the rector, which will in most cases be readily given. In some churches a small charge is made for permission to assist the church funds.

The rubbings when made should be carefully classified as knights, ecclesiastics, civilians, and so on, and the date of the brass should be recorded on each rubbing.

ANSWERS TO THE PUZZLE GAME ON PAGE 6544

In the botanical puzzle game on page 6544, descriptions were given of six different plants, and we had to name these plants of such varied characters, uses, and appearance

from the descriptions given. The correct solutions are as follows: 1, Bladderwrack; 2, Mushroom; 3, Sweet-scented vernal grass; 4, Hyacinth; 5, Wheat; 6, Coconut palm.

HOW TO KNOW THE ROCKS

It is very interesting to be able, as we go about in different parts of the country, to tell what kind of rocks are round about us. Especially does it add to the interest of a railway journey if, as we pass through cuttings or enter and leave tunnels, we can name the rock formations that we are passing, and tell to what period of the world's history they belong.

The earth's crust is made up of various layers of rock, some of it formed by the action of water, and other parts due to the action of fire.

When the rock can be seen exposed to view, as in a more or less perpendicular cliff or in a very steep cutting, it will be at once noticed that it has one of two general characters. Either it is in layers, or strata, as they are called, or it has no such regular arrangement. Although not invariably, it may usually be taken for granted that the stratified rocks—those in layers—were formed by the action of water, while the non-stratified, or irregular rocks, are the result of fire. There are some formations of rocks known as metamorphosed, or changed rocks, which are more or less in layers, though these are not so pronounced as the stratified rocks. They were originally formed by water, but have since been affected by fire, and so changed that they have little resemblance to their original form.

First of all, we shall learn the character and appearance of some of the stratified rocks.

There is limestone, which is so much used for building, making cement, statuary, and other purposes. It varies a great deal, being sometimes white, resembling loaf sugar in both colour and texture. An exposed layer of this is very striking.

Limestone is sometimes cream colour or dull-yellow, varying to blue-grey; and while it is often close grained, or built up of tiny crystals, it is also at other times like chalk. Marble is really a limestone. There is a sort of limestone called oölite, which is made up of round grains that give it the appearance of a fish's roe. It is found in the Cotswold Hills of Gloucestershire, and on the moors of Yorkshire, and may be readily recognised from this description. Sometimes veins or masses of a dull red rock are seen on the limestone, as in West-

morland, for instance. This is an iron ore called hematite, and it gets its colour from the iron that is in it.

In chalk cliffs we see many nodules, or rounded lumps of hard, black, or grey, or brown rock, which, when split, have a more or less transparent edge. These pieces are made of the ordinary common flint. Sandstone looks like what its name implies—a stone made up of grains of sand. It varies, of course, according to the size and colour

of the grains, some sandstone being coarse and other fine grained, while the colour may be either red, brown, yellow, or green. The strata, or layers, are usually very plain. It is the ease with which some kinds of sandstone can be split along the layers that renders this particular rock so useful for paving stones. Another kind, found in Scotland, splits into

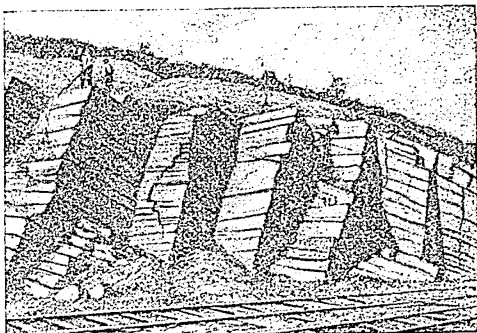
large blocks, and is used for building. It is called freestone.

The conglomerate, or pudding stone, can usually be identified. As we pass through a cutting, or see it along the face of a cliff, it looks, as its name indicates, like a plum-pudding. Big and little pebbles are thickly embedded in a layer of sandstone and look something like the plums and currants in a Christmas pudding. When the pebbles are sharp and angular instead of rounded, the rock is called breccia.

The rocks formed by fire are as varied as those that owe their construction to the action of water. Granite we all know, whether it be red or grey, because it is the stone used for kerbs in all our towns and cities. A pitch-like stone, varying in colour from green to brown and yellow, that may be seen in veins or masses

bursting through other rocks in the Isle of Arran, is pitch-stone. Basalt is easily recognised by its black, uniform colour and its curious structure, which is in columns, like the Giant's Causeway and the Isle of Staffa, in Scotland.

Very often, we see crossing another rock a vein of dull, dirty-green colour, streaked with brown or red. This is the well-known serpentine that looks so beautiful when polished and made up into ornaments. It is found usually with the limestone rocks. The metamorphosed, or changed, rocks



Limestone rocks, showing the well-marked layers



Conglomerate, or pudding-stone, with pebbles embedded

have, as might be supposed, an appearance something like both the other kinds of rock—those formed by fire and those by water.

There is a rock that looks like granite, but the minerals of which it is composed are arranged more or less in layers. It has been called stratified granite, but it is really gneiss. Another rock, which has a slaty

appearance at a distance, and consists of layers of white quartz and mica, is known as mica-schist. The thickness of the layers of each mineral vary greatly, but mica-schist always has an appearance that once recognised cannot be mistaken. These are the two principal rocks of the metamorphose class that occur in Britain.

HOW TO PLAY BAGATELLE

BAGATELLE is played with a cue and nine ivory balls, one of them being black, on a table ten feet long and three feet wide. This table, which is usually made to fold across the middle for packing away, has nine small cups sunk in it instead of being fitted with pockets round the edge like a billiard table.

The usual game is for each player in turn to take all the balls and to cup as many of them as possible. Before beginning to play it is essential that the board should be placed absolutely level. If the dining, or other table on which the folding bagatelle board is laid, is not quite horizontal the bagatelle board may be levelled quite easily by placing small wedges under it here and there as required, while the board is tested at various points with a spirit level.

All being ready the first player takes the black ball and puts it on the ivory spot in front of the first cup. He then takes one of the other balls and places this on or behind the ivory spot at the other end of the board, and with the end of the cue strikes it so as to drive it up the board and make it hit the black ball. Till the black ball is hit no score can be made, and if the first white ball misses it, that ball is called dead, and is removed from the board.

With a second white ball the player then has another shot at the black ball. Should he strike the black ball with the first or any other white ball he plays all the other balls in succession, his object with these being to get them into the cups, which are

numbered from one to nine. When he has played all the balls, the score is counted up by adding together the numbers of all the cups in which balls have been placed. As the black ball doubles the number of the cup into which it falls, the great idea is to get this into the central cup, 9, which then counts 18. Sometimes the black ball is coloured red instead of black, and sometimes there are three coloured balls, all of which count double.

The great thing in playing bagatelle is to play gently. If we strike hard with the cue the ball will come back beyond the middle of the board, when it is reckoned dead and is taken off; or, if it goes into a cup, it will bound out again.

To get the black ball into the 9 cup, strike it with one of the other balls against the top of the board, so that it will recoil either between the 5 and 2 or between the 5 and 3, coming to rest between the 4 and 9 or 6 and 9. Then a gentle tap with the next ball will drop it into the required cup. The numbers 8 and 7 are best scored by playing the ball against the side of the board opposite the 4 and 6 cups, so that it rebounds at an angle and falls into the cup.

Any score such as 50 or 100 may be reckoned a game. If, in striking a ball, this is not hit hard enough to send it across the middle of the board, which is technically known as the string, it may be replaced on the spot and a second shot taken. If a ball bounces off the table, it may not be replaced.

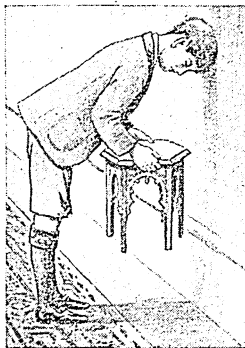
A SIMPLE FEAT THAT IS QUITE IMPOSSIBLE

HERE is what seems a very simple feat, yet nobody can do it. It forms a good game for a party, and is interesting as well as entertaining, for it teaches an important scientific lesson.

We place a low stool close up against the wall. Then, standing with our feet together, twice the width of the stool from the wall, we stoop down and grasp the stool as shown in the picture, with one hand on each side, at the same time resting our head against the wall.

Now comes the feat which is impossible. Standing in the position shown, with the stool in our hands, we have to rise steadily to the erect position without moving our feet and

without jerking our body. It seems so simple, yet directly we try to do it we find ourselves helpless.



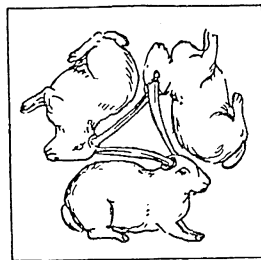
The explanation is, of course, that by standing in this position and holding the stool we have thrown our centre of gravity far to the front and beyond our control. If the wall were not there we should fall over forward, as we can guess by the pressure on our heads, for we are in what science calls a state of unstable equilibrium.

With a large gathering of boys and girls we can have much fun with this scientific lesson, especially if there happen to be grown-up people present who will also try to perform the feat.

TRICKS FOR ODD MOMENTS

THE RABBIT'S EARS

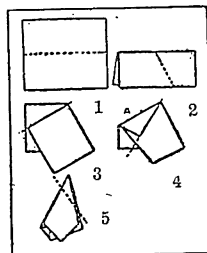
IF we were asked to draw three rabbits, and to give them only three ears between them, yet to make them appear as if they really had two ears each, no matter how clever we might be as artists, we should think that an impossible and ridiculous task had been set us. Yet such is not really the case, for, as can be seen by this picture, the drawing can actually be made and the conditions fulfilled. By a skillful arrangement



of the three rabbits and the three ears, as shown in the picture, the little animals appear to be quite properly equipped with ears, although they have only three between them

A STAR MADE WITH ONE CUT

IT would at first thought seem to be quite an impossibility to cut a five-pointed star out of a square of paper with one single snip of the scissors, and yet it is quite easy to do so. Everything, of course, depends upon the method of folding the paper before cutting, but if the square of paper be folded exactly as shown in the accompanying diagrams, and then the folded paper cut with one snip in the direction of the dotted line in the fifth diagram, we shall have a star. In folding the paper at the stage shown in the fourth diagram, so as to get that shown in the fifth, we must fold from



the point A across to the right. In all cases fold across the dotted line—that is, when you have the paper opened out flat, as in diagram 1, fold across the dotted line to make diagram 2; then, to get the shape shown in diagram 3, fold across the dotted line in diagram 2, and so on to position 5.

HOW TO PLAY LEAP-FROG

LEAP-FROG is a fine, healthy game for boys which provides plenty of good exercise and requires no apparatus.

The first player makes "a back," that is, he bends down with his back horizontal and his head well down. Another player now takes a short run, and, placing his hands on the back, springs over, alighting on his feet. Then, running a few yards forward, he offers a back, and the third player thus has two backs to leap over in quick succession. So player after player takes his turn to leap over as many backs as are down, and when he reaches the last, jumps over that, and a few yards ahead himself offers a back.

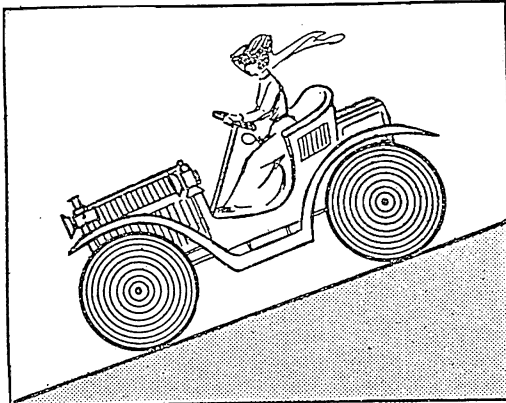
THE MAGIC WRITING

WE can have some fun with our friends by causing what seems to be magic writing to appear upon the surface of an ordinary looking-glass when it is breathed on. Unknown to our friends, we write upon the glass with a piece of French chalk, and then we wipe out the writing with a soft cloth, such as a handkerchief. The writing cannot now be seen, but if we breathe upon the glass it will instantly become visible, and, to those not in the secret, will seem very mysterious.



THE WHEELS THAT TURN

HERE is a picture of a motor-car going along a hilly country road. There are no police traps, and the motor is going at a great speed. We can see that it is moving by the way the wheels are going round. We may not think at first that the motor is really



going at all, but if we put this book down flat on the table and look steadily at the centre of either wheel, with our eyes about a foot from the book, and then, without raising the book from the table, give it a quick circular motion, the wheels will appear to be going round rapidly.

In this way any number of boys can get a great deal of fun, the more the merrier. The great thing is to "keep the pot a-boiling," and when the game is fast and furious the excitement is very great.

Any player who fails to make a clean over is reckoned out.

One or two things should be borne in mind. The player must not press too heavily on the shoulders of the boy who is presenting a back, but must go over with a light spring. Then the boy who is down must remain firm and still without any shrinking at the moment of the leap, or the one jumping will probably have a nasty fall.

20 FIVE-MINUTE PUZZLES

1. RIDDLE-ME-REE

My first is in saddle and also in strap,
My second's in programme and also in map,
My third is in letter and also in send,
My fourth is in tearing and also in rend,
My fifth is in linden and also in lime,
My sixth is in clamber and also in climb,
My seventh's in clatter and also in roar,
My whole is a land great in peace and in war.

2. ARITHMETICAL PUZZLE

"How many miles did you motor yesterday and the day before?" asked Mr. Brown of his neighbour. "Well," replied the neighbour, "the number of miles I motored yesterday was the number I motored the day before with the figures reversed; and the difference between the two numbers is one-eleventh of their total." How many miles did Mr. Brown's neighbour motor on the two days?

3. BURIED PROVERB

An American proverb lies buried in this sentence; what is it? "While there are very many as kind as this, they know no task unkind."

4. PUZZLE WORD

Eight letters (start with be)
Three syllables contain;
Take one away and see
Four syllables remain.

5. CHARADE

My first of unity's the sign;
My second ere we knew to plant,
We used upon my whole to dine,
If all be true that poets chant.

6. THE DISTANT RELATION

"Who was that young man who raised his hat just now as he passed in a taxi?" asked a lady of her friend.

"Oh," was the reply, "that gentleman's mother was my mother's only daughter." Who was he?

7. RIDDLE-ME-REE

My first is in people but not in crowd,
My second's in shower but not in cloud,
My third is in apple, but not in pie,
My fourth is in purchase but not in buy,
My fifth is in Peter but not in Paul,
My whole is a state desired by all.

8. HIDDEN TOWNS

Name the towns hidden in this sentence: After he had had a bath he went to bed for desired rest and slept. Then he was awakened by a dove rustling outside the window. Presently a servant knocked at the door, and said: "Sir, the parcel you were expecting has arrived. It is now coming up; arise to receive it."

9. RIDDLE-ME-REE

My first is in apple and also in pear,
My second's in desperate and also in dare,
My third is in sparrow and also in lark,
My fourth is in cashier and also in clerk,
My fifth is in seven and also in ten,
My whole has now come as a gift unto men.

10. RIDDLES

- a Why is a tumbler like a boxer?
- b Name that which is both food for the body and food for the mind.
- c When is a wall like a fish?
- d When is a pie in the oven like a poet?
- e Why should a naval officer never put his chronometer under his pillow?
- f What is the difference between a cow and a broken chair?

11. ANAGRAM

Cato and Chloe combined well together
Make a drink not amiss in very cold weather

12. RHYMING RIDDLE

I know a word with letters three,
Add two and fewer there will be.

13. TRANSPOSITION

A chain of mountains will appear
If you the name transpose
Of those who were in ancient days
Britain's piratic foes.

14. BEHEADED WORD

In the dark you will see that I falter,
Behead and I now am a halter.
Behead once again and you'll know it,
I'm open and used by the poet.

15. CHARADE

My first is nothing but a name;
My second still more small;
My whole of so much smaller fame,
It has no name at all.

16. BUILT-UP WORD

A post of honour and disgrace;
A trap to catch the finny race;
United they will give a town
Near London and of some renown.

17. ENIGMA

The sun shines clear, serene the golden sky,
Where'er you go or run as fast I fly;
With your bright day my progress, too, does end;
See here, vain man, the picture of a friend.

18. PUZZLE WORD

Name an English word of three syllables that has three vowels in it and only four letters altogether.

19. RIDDLE-ME-REE

My first is in Paris and also in France,
My second's in happen, and also in chance,
My third is in pricker and also in pin,
My fourth is in thickness and also in thin,
My fifth is in friendship and also in hate,
My whole is the symbol of victory great.

20. ARITHMETICAL PUZZLE

Answer this question very quickly: What is a third and half a third of a hundred?

The answers to these puzzles appear in Section 55 of Group 18